Medical Library
OCT 17 1944

BRITISH MEDICAL JOURNAL

JOURNAL OF THE BRITISH MEDICAL ASSOCIATION

SATURDAY SEPTEMBER 30 1944

TABLE OF CONTENTS

Infantile Diarrhoea and Vomiting M. B. ALEXANDER, M.R.C.S., and Y. EISER, M.D. 425

Inhibition of Lactation by Hexoestrol Dipropionate FREDERICK PRESCOTT, Ph.D., and MARGARET BASDEN, M.D. 428

Factors Influencing Dermatitis in Coal-miners R. B. KNOWLES, M.D. 430

Intravenous Anaesthesia W. M. MAIDLOW, M.R.C.S. 432

Sympathetic Block for Traumatic Shock D. ENGEL, M.D. 434

The Midday School Meal in Relation to Schoolboys' Weekly Dietary R. P. COOK, M.B., W. A. DAVIDSON, M.D., D. M. KEAY, M.B., and D. G. MCINTOSH, M.B. 443

MEDICAL MEMORANDA

Suppurative Pylephlebitis. P. MACDONALD TOW, M.R.C.S. 435
Broad Ligament Cyst in a Strangulated Hernia. KATHLEEN BERGER, M.B. 435

GENERAL ARTICLES AND NEWS

Schemes for Medical and Social Research 444
Apparatus for Continuous Intravenous Anaesthesia. W. M. DENNISON, F.R.C.S.Ed. 437
THE ORDER OF ST. JOHN 443
THE SERVICES 451
MEDICAL NEWS 456

REVIEWS

Medical Services in Eire 436
Mental Health and the War 436
Regional Analgesia 436
Notes on Books 437

OBITUARY

Sir Humphry Rolleston, BT., G.C.V.O., K.C.B. 452
F. D. Marsh, M.B., F.R.C.S. 454
Dennis Embleton, M.B. 454
Helen Lukis, M.D. 454
James Whitton, M.D., F.R.C.S.Ed. 455
Alexander Francis, M.B. 455

Epidemiology Section 455

LEADING ARTICLES

Hypoglycaemia 438
Infantile Gastro-enteritis 439

ANNOTATIONS

Cholinesterase and Myasthenia Gravis 440
Ophthalmology in the Field 440
Paregoric 441
Cheese-borne Outbreak of Typhoid ... 441
Colitis and *X* Rays 442
Health of American Troops in Pacific 442

LETTERS AND ANSWERS

Byssinosis Regulations—Surgical Treatment of Migraine—Tentorial Pressure Cone—Death from Drowning and under Anaesthesia—Vertical Fluoroscope—Therapeutic Dosage of Iron—Coronary Thrombosis and Car Driving—Treatment of Ganglion—Treatment of Otitis Externa—Otosclerosis and Internal Secretion—Blue Bag for Stings—Habitual Hypnotic—Diet for Steatorrhoea—Solvent of Colourless Flavine—Release of Wounded Medical Officer—Interpretation of G.C.F.T. 456-8

SUPPLEMENT

Report of Insurance Acts Committee... 69
Medical Relief Abroad: Doctors Needed by UNRRA 71
CORRESPONDENCE 71
ASSOCIATION NOTICES 72
POSTGRADUATE NEWS 72

CORRESPONDENCE

Air-borne Infections. STUART MUDD, M.D. 444
Renal Osteodystrophy. GEORGE GRAHAM, M.D., and W. G. OAKLEY, M.D. 445
Dentition and Diet. T. OCKERSE, D.D.S. 445
Ascorbic Acid for Bleeding Gums. W. P. STAMM, M.B., T. F. MACRAE, D.SC., and S. YUDKIN, M.B. 446
Fracture-dislocation of Astragalus. J. R. ARMSTRONG, F.R.C.S. 446
Fractures of the Carpal Bones. B. S. SKINNER, M.R.C.S. 446
Laryngeal Spasm. STEPHEN COFFIN, M.R.C.S. 447
Trypanosomiasis treated with Pentamidine. R. D. HARDING, D.M. 447
War Malaria and its Treatment. H. M. OWEN, M.B. 447
Specialties and Diplomas. F. M. R. WALSHE, M.D.; J. S. CALLCUTT, M.B. 447
Present-day Medical Education. H. A. LANG, M.B. 448
Observation in the Student's Training. JOHN GRIEVE, M.B. 449
Limitations of Current Medical Training. RICHARD STURTON, M.R.C.S.; I. S. STADDON, M.B. 449
Refresher Courses for the G.P. H. S. PASMORE, M.B. 450
Cancer Clinics: Beware. A. WILFRID ADAMS, F.R.C.S. 450
Lay Psychotherapy. D. H. KITCHIN 450
Mass Radiography. B. LEGGETT, M.R.C.S. 450
Service Medicine 451
Thumb-sucking. MARY SHERIDAN, M.D. 451

BRITISH MEDICAL ASSOCIATION, TAVISTOCK SQUARE, LONDON, W.C.1

No. 4369, WEEKLY, PRICE 1/6

Copyright

REGISTERED AS A NEWSPAPER

TRADE MARK **'SECONAL'** BRAND

SODIUM PROPYL-METHYL-CARBINYL ALLYL BARBITURATE

A Rapidly Effective and Short Acting Barbiturate for Dependable Sedation and Hypnosis

'Seconal' will be found exceptionally useful for medical indications or before surgical procedures where a comparatively rapid and brief acting hypnotic or sedative is required.

'Seconal' is supplied in 1½ grain and ¾ grain 'Pulvules' brand Filled Capsules in bottles of 40 and 500.

ELI LILLY AND COMPANY LTD.
BASINGSTOKE AND LONDON

Control of Head Lice

It is now possible to kill lice and nits in the head by the simple application of Semprolia Insecticide, a combination of Lethane 384 Special and a White Oil, faintly scented with Citronella.

NO ODOUR DISTINCTIVE OF THE TREATMENT

Simple application by massaging into the scalp. No combing is required—indeed, it is contra-indicated except *after* treatment for removal of dead nits. Treatment is economical—individual application half to two drachms only.
Sample, details of packages for clinical use and home treatment and prices, on application.

'Semprolia' BRAND

MEDICATED (LETHANE) HAIR OIL N.W.F.

Insecticide for control of Nits and Head Lice

•

STEMCO LIMITED
128 Albert Street · Camden Town · London, N.W.1
Agents in Eire — May Roberts (Ireland) Ltd., Grand Canal Quay, Dublin

Respiratory Emergencies!

SPARKLET RESUSCITATOR
The 'Sparklet' Resuscitator has again and again proved invaluable in the Carbon Dioxide treatment of Respiratory Failure Emergencies.

CO_2 Snow Sticks!

POCKET CO_2 SNOW OUTFIT
With this outfit, CO_2 Snow Sticks are prepared in a few moments, and the treatment of skin blemishes made convenient and economical.

Write for special booklets to Dept. 43
SPARKLETS LIMITED
LONDON, N.18.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY SEPTEMBER 30 1944

INFANTILE DIARRHOEA AND VOMITING

BY

M. B. ALEXANDER, M.R.C.S.

Grove Hospital, L.C.C.

AND

Y. EISER, M.D.Prague

Late North-Western Hospital, L.C.C.

This series comprises 140 cases of infantile diarrhoea and vomiting treated at the North-Western Hospital between June, 1943, and February, 1944, inclusive.

Summary of Cases

Age.—The infants were all under 15 months of age. Older children were excluded, since the disease is less common and invariably milder after the age of 15 months. When divided into five age groups, of 3 months each, 115—i.e., 82.1%—of the infants were in the first three age groups (0 to 9 months), the incidence falling sharply after 9 months. The severity, as judged by dehydration, was also greatest in the first 9 months of life, with 56.5% of dehydrated infants as compared with 16% in the age groups IV–V (9 to 15 months). This incidence corresponds with that found by Campbell and Cunningham (1941). There were no deaths among the infants over 6 months of age (Tables I and II).

TABLE I.—*Distribution in Age Groups: Death and Dehydration Rate in Each Age Group*

Age Groups	No. of Cases	Deaths		Dehydration		% Deaths among Dehydrated
		No.	Case Fatality %	No.	%	
I—0–3 months ..	38	4	10·5	23	60·5	17·3
II—3–6 ,, ..	49	4	8·1	27	55·1	14·8
III—6–9 ,, ..	28	0	0	15	53·5	0
IV—9–12 ,, ..	13	0	0	3	23·6	0
V—12–15 ,, ..	12	0	0	1	8·3	0
Total	140	8	5·7	69	49·3	11·6

TABLE II.—*Incidence, Dehydration, and Mortality in Infants Under and Over 9 Months*

Age in Months	No. of Cases	Dehydration		Deaths	Case Fatality %	% Deaths among Dehydrated
		No.	%			
0–9	115	65	56·5	8	6·9	12·3
9–15	25	4	16	0	0	0
Total	140	69	49·3	8	5·7	11·6

Prematurity.—There were 8 premature infants in this series, all under 7 weeks old on admission. All 8 were dehydrated, and 7 required intravenous therapy. There were 3 deaths. The illness in all these cases was very severe, and convalescence slow. It is of interest to note that 3 of these babies had severe anaemia requiring blood transfusions, and that slow-drip transfusions of 200 to 250 c.cm. of blood were well tolerated after initial correction of fluid loss.

Sex.—Males predominated in the ratio of 3 : 2.

Season.—No deductions can be drawn from the number of admissions per month, as these were governed by external factors. Severity, as judged by dehydration, appeared to be highest in the winter months; but, again, no deductions can be made, as this series does not include the spring quarter.

Environment.—Twenty infants were admitted from institutions; of these, 14 were dehydrated, 8 required intravenous therapy, and 1 died. Seventeen were admitted from other hospitals, of whom 12 were dehydrated and required intravenous therapy, and 1 died. The remaining 103 infants were admitted from home; of these, 43 were dehydrated and 6 died. We are unable to say what proportion of this last group were attending day nurseries.

Breast-feeding.—In this series 17 babies were breast-fed—8 wholly and 9 partially. This rather high incidence (12.1%) may be partly accounted for by the fact that cases were admitted from a maternity unit. Ages ranged from 1 week to 5 months in the case of the fully breast-fed infants, and from 3 to 10 months in the partially breast-fed babies. One fully and 4 partially breast-fed infants were dehydrated and required intravenous therapy. Breast-feeding was continued wherever possible. There were no deaths in this group. The illness was seldom so severe as in the artificially fed babies, and recovery was quicker and usually uncomplicated.

Dehydration and Severity.—Forty-nine infants were dehydrated on or soon after admission, and a further 20 became dehydrated more than forty-eight hours after admission—i.e., 69 cases in all, or 49.3% of the total. Of these, 26 showed evidence of extreme fluid loss, and 11 of them were collapsed on admission, exhibiting unmistakable signs of shock—cold, clammy skin; subnormal temperature; thin, thready, or imperceptible pulse; cyanosis of lips and extremities; shallow or sighing respiration—in addition to the usually severe dehydration. None of these 11 died. In 6 cases "orange" stools—an unfavourable prognostic sign—appeared for more than twenty-four hours during the course of the illness; 5 of these patients recovered and 1 died.

Duration.—The average stay in hospital was 30.2 days. No deductions can be drawn from this figure as many infants were, for administrative reasons, kept in hospital after recovery.

Mortality and Cause of Death.—There were 8 deaths in this series, giving a case fatality of 5.7% for all cases, or 11.6% of dehydrated cases. All these 8 infants were under 6 months of age, and 6 of the 8 deaths followed relapses. Post-mortem examinations were performed in 7 cases, and the causes of death found were: suppurative pericarditis (*Staph. aureus*), 1; circulatory failure due to excessive parenteral fluids, 2. The remainder of the deaths were classified as due to gastro-enteritis, complicated by otitis media in 1 case and by whooping-cough and secondary pneumonia in another.

Parenteral Infection

An attempt was made to investigate the presence and type of parenteral infection in these cases, based on the following criteria: (1) A history of parenteral infection preceding or concurrent with the onset of diarrhoea and vomiting. (2) Clinical signs of parenteral infection on admission—i.e., rhinitis, tonsillitis, otitis media, bronchitis, furunculosis, etc. (3) Bacteriological confirmation: nose, throat, and post-nasal swabs, and faeces and rectal swabs were taken from all infants on admission, and at intervals throughout the course of the illness, for bacteriological examination. In addition, swabs were taken from any discharge—e.g., pustules, otorrhoea. The urine was investigated in a few cases only, owing to the difficulty in collecting sterile samples of urine from babies with diarrhoea. All infants showing bacteriological evidence of intestinal infections such as bacillary dysentery and giardiasis were excluded from this series.

1. In 36 cases there was a history of parenteral infection immediately before the onset of diarrhoea and vomiting, and in 58 cases accompanying this—a total of 94 cases, or 67.1% of all. In many instances upper respiratory infections had been present in other members of the family before the infant's illness.

2. In 124 cases (88.6%) there was definite clinical evidence of parenteral infection on admission, mainly of the respiratory tract. There were 60 cases of otitis media. Only those cases in which a purulent otorrhoea occurred spontaneously or was found at myringotomy were included under the heading of otitis media. In 49 of these otorrhoea was present on, or within forty-eight hours of, admission. In the remaining 11 cases the otorrhoea appeared in 5 to 20 days; in all these 11 there had been evidence of upper respiratory infection on admission. Myringotomy was performed in 38 cases, and bilateral mastoidectomy in 11. Table III shows

TABLE III.—*Incidence and Type of Parenteral Infection present in 140 Cases*

Parenteral Infection	No.	
Upper respiratory infection	29	41
Tonsillitis	12	
Otitis media	20	60
Otitis media + other infections	40	
Bronchitis	11	13
Pneumonia	2	
Skin infections	8	
Stomatitis	1	
Conjunctivitis	1	
Total	124	

Note: Upper respiratory infection = rhinitis and pharyngitis.

the type and incidence of parenteral infection present in the whole series. In 88 cases (62.8%) pyrexia (temperature above 99° F.) occurred within twenty-four hours of admission. In 80 of these the pyrexia was associated with other evidence of parenteral infection, and in 8 no signs of parenteral infection could be found. Subnormal temperatures were observed in the 11 infants admitted in a state of shock. Temperatures of 101° to 103° F. sometimes appeared after the parenteral administration of plasma; we have tried to separate these from the initial pyrexia, which seemed to be due to the parenteral infection. It is noteworthy that 19 of 27 relapses (70.4%) were preceded by signs of parenteral infection and a rise of temperature above 99° F. Very often there was only a slight pyrexia of less than twenty-four hours' duration, which was followed in 24 to 72 hours by a relapse of the diarrhoea and vomiting, in some cases surprisingly severe, and with no further rise of temperature until the final agonal peak in the cases ending fatally.

3. Table IV shows the incidence and type of pathogenic organisms cultured from the upper respiratory tract on admission. The presence of *Staph. aureus* in the nose only was not regarded as significant, and these results are omitted from this table. The mere presence of

TABLE IV.—*Incidence and Type of Pathogenic Organisms Cultured from the Upper Respiratory Tract*

Organism	N	T	P.N.	P.N. + N or T	Ears	Ears + N or T or P.N.	Skins	Total
Haem. strep.	2	6	4	11	0	2	0	25
Pneumo.	2	1	4	5	7	3	0	22
Staph. aureus		3	3	7	8	10	2	33
Total	4	10	11	23	15	15	2	80

Note: N = Nose. T = Throat. P.N. = Post-nasal.

these organisms in the nasopharynx does not necessarily imply an infection with them, but we feel that they are of significance if taken in conjunction with the clinical findings.

The discrepancy between the positive bacteriological findings in the ear discharges—30—and the actual number of otorrhoeas—60—may be partly explained by the difficulty of obtaining sterile cotton-wool swabs small enough to be passed through the infant's narrow meatus to reach the perforation or myringotomy wound. In the remaining cases only saprophytic organisms such as *Staph. albus*, diphtheroids, etc., were recovered on culture. Among the 11 mastoidectomies, swabs from the bone at operation were sterile in 7 cases. In the remaining 4, pneumococci, haemolytic streptococci, *Staph. aureus*, and *B. coli* were found each in one case. But although the incidence of bacteriologically proved mastoiditis may be no higher in diarrhoea and vomiting than that following otitis media in older children, mastoidectomy should always be considered in those cases of diarrhoea and vomiting in which pyrexia persists and the child fails to respond to sulphonamide and intravenous plasma therapy, provided the ear has shown some signs of inflammation and no other focus of infection has been demonstrated. The operation carries very little risk in experienced hands after careful pre-operative correction of dehydration and anaemia.

"Parenteral diarrhoea" is given a definite place in the classification of infantile diarrhoea and vomiting in all paediatric textbooks, where it is usually stated that the gastro-intestinal symptoms are secondary to systemic or localized infection, and that they tend to clear up as soon as the parenteral cause is removed. The primary infection may be of virus, bacterial, or perhaps combined origin, and may be of surprisingly trivial nature. It is, however, well known that not all babies react thus to minor infections; and therefore, while accepting the role of the parenteral infection as an inciting agent in most of our cases, we feel that a greater tendency to respond to such stimuli by severe gastro-intestinal symptoms must be postulated in individual babies. Quite often the whole clinical picture is most suggestive of an upset caused by some "trigger" mechanism setting up the disproportionately violent reaction of diarrhoea and vomiting which eventually marches on its own way to a fatal outcome, regardless of the triviality of the first provoking factor. Here, certainly, death is due, not to infection, but to profound irreversible changes in the body chemistry.

Dehydration

The assessment of dehydration and degree of fluid loss is still based on subjective criteria and is often very difficult, especially in chubby, well-covered infants, in whom skin signs are absent or misleading. The need for a reliable laboratory or bedside test is great. Much excellent work has been done on the changes in body chemistry occurring in dehydration, in both adults and babies (Hoag and Marples, 1931; Aldridge, 1941). Most observers agree that the level of plasma chlorides and proteins in no way indicates the amount of fluid lost. The haematocrit and alkali-reserve determinations are considered more useful. In a few severely dehydrated infants in this series, all over 2 months of age, the haematocrit readings on admission ranged from 27 to 41 (average 36), obviously not confirming the clinical picture of severe fluid loss. When water balance had been restored, most of these infants were found to have a considerable degree of anaemia, which would account for the apparent absence of haemoconcentration. The accepted normal figure for the haematocrit in babies is 42, but Aldridge states that in infants of 2 to 8 months the normal reading is less than 38.

The low alkali reserve, ranging from 40 to 61.5 c.cm. (average 50.4 c.cm.), was more in keeping with the clinical condition of these infants. Unfortunately, the estimation of alkali reserve is time-consuming, and cannot easily be performed in small laboratories.

A raised blood urea was the most constant finding in our cases, the figures ranging from 50 to 112 mg. per 100 c.cm. (average 76 mg.), and corresponding fairly closely with the clinical assessment of dehydration in the individual cases.

PLASMA PROTEINS

The normal figures for plasma proteins in babies given in the literature vary widely. Hickmans, Finch, and Tonks (1943) give readings of 6 to 7.4 g. per 100 c.cm. for normal infants over 10 weeks of age. They quote Kylin (1932) for figures ranging from 4.6 to 6.5 g. for babies under 2 years of age, and Rennie (1935) from 6.04 to 8.0 g. per 100 c.cm. for babies of 3 to 23 months. The plasma protein levels found on admission in 7 of our severely dehydrated infants ranged from 5.06 to 6.44 g. (average 5.7 g.). The ages of these infants ranged from 2 to 8 months, and the average duration of diarrhoea before admission was 5 days, and of vomiting 3.9 days. Plasma protein levels were estimated in 4 other babies, 3 of them premature infants who, 1 to 2 days after intravenous therapy had been stopped, developed oedema while still apparently insufficiently hydrated. These values were: 4.7, 5.85, 5.7, and 4.3 g. per 100 c.cm., or an average of 5.14 g. Marked improvement and disappearance of the oedema followed the intravenous transfusion of half-strength serum in 2 cases, and of blood and half-strength serum in the other 2.

It is not unreasonable to assume that there exists in these infants some degree of protein deficiency, due mainly to restricted intake in their diluted feeds, and impeded digestion

and absorption of feeds; there may also be loss of proteins through the damaged capillaries of the intestinal wall. Recent work has shown that premature infants usually have a lower plasma protein level than full-term babies. Hickmans, Finch, and Tonks (1943) found readings of 3.7 to 5.4 g. per 100 c.cm. in premature babies in the first four weeks of life. The deficiency may therefore be expected to be still more marked in premature infants with diarrhoea and vomiting, who probably also have a smaller store of proteins in their bodies.

Formerly, we had found the correction of fluid loss by crystalloid solutions very difficult in some cases; prematures, especially, often became oedematous before being fully hydrated. The early administration of diluted serum or plasma has been of real assistance in overcoming this difficulty, and also in restoring and maintaining the circulation in badly shocked cases. We noted one other effect of the injected plasma—namely, an early reduction in the size and frequency of large, watery stools.

DANGERS OF SERUM THERAPY

We wish to draw attention to the dangers of too enthusiastic serum therapy. During the course of intravenous therapy it was our custom to follow each vacoliter bottle of half-strength serum or plasma by a bottle of half-strength Hartmann's (Ringer-lactate) solution + 5% glucose. In 4 consecutive cases half-strength serum was infused continuously. Although the quantity of fluid given did not exceed the requirements for body weight (2½ oz. per lb. per day plus an allowance of 3 to 6% of body weight for dehydration), in less than 24 hours the children showed signs of respiratory embarrassment, marked cyanosis, rapid thready pulse, and anuria. No oedema was found. Two of these babies died of cardiac failure, and 2 recovered after the administration of diuretics and continuous oxygen, the intravenous drip being discontinued. It seemed that in these small infants the continuous infusion of proteins caused the tissue fluids to be drawn into the blood stream in order to lower the raised osmotic pressure of the circulating blood, and there to be retained, thus causing circulatory embarrassment.

Heyl and Janeway (1942) state that 1 g. of albumin, which is osmotically equivalent to 1.25 g. of plasma protein, attracts, on an average, 18 c.cm. of fluid into the circulation in one hour. Thus the danger of giving large quantities of undiluted plasma intravenously to dehydrated infants is obvious. Normally, the total quantity of protein which we gave intravenously in the first 48 hours of treatment to a baby weighing 10 lb. was approximately 15 g., the serum or plasma being diluted with Hartmann's solution. We are unable to say how much of this injected protein was actually metabolized by the body; but it is our impression that the plasma helped to restore the water balance more quickly and with greater safety, and to maintain it until the infant was able to take full feeds.

LIVER CHANGES

We would like to make a plea for further research into the origin of the fatty liver so often found at necropsy on cases of protracted diarrhoea and vomiting. Macro- and microscopical evidence of liver damage was found in 6 of our babies on whom post-mortems were performed, in extreme degree in 2 of them. Lately, a good deal of work has been done on diets producing and preventing liver damage (Ravdin *et al.*, 1943; Himsworth and Glynn, 1944). Although various other factors probably cause the initial toxic changes in the livers of babies suffering from diarrhoea and vomiting (e.g., infection), it seems to us that the extreme fatty infiltration often found after death may be at least partly due to protein starvation, especially lack of some of the important amino acids. These children often live for weeks on diluted "milk formulas," the digestion of which is further impeded by diarrhoea and persistent vomiting. We have often witnessed in these babies what, in an adult case, would have been called a death from liver insufficiency. This, according to personal communication, has also been the impression of other workers. Some of these infants did not appear at all cachectic even at necropsy, and yet the condition of their livers was clearly incompatible with life.

This applies equally to the plump, apparently slowly recovering babies, who when stricken down with a new infection very often have an alarmingly severe relapse, frequently fatal. The severity of the second attack is usually ascribed to a reinfection with a more virulent form of gastro-enteritis. We feel that due attention should be paid to the possibility that these children, although outwardly in good condition, may not yet have repaired the liver damage caused by the first attack and possibly accentuated by weeks of careful but very deficient feeding. The inability of patients with damaged livers to stand up to even minor infections is well known, and this should be borne in mind before postulating increased virulence of the second attack.

Relapse

As has been said above, there were 27 relapses in this series (19.3% of all cases), and 6 of these patients died. The relapses were commonly more severe than the primary attack. In 19 cases (70.4%) the relapse was preceded by pyrexia and clinical signs of parenteral infection.

Approximately half the infants (73) were nursed in cell wards; among these there were 6 relapses, or 8.2%, and 1 died. The remaining 67 infants were nursed in a 20-bedded "barrier" ward, with the same routine of management and treatment; here there were 21 relapses (31%), with 5 deaths. The highest relapse rate occurred during a period when the number of bottle babies in the barrier ward reached 16. Nursing in barrier wards, therefore, however strictly the rules of bed-isolation are observed, does not appear to be as effective as cell or single-bedded-ward nursing in the prevention of cross-infection.

Haematology

In a number of cases, especially those in which a mastoiditis was suspected, total and differential white cell counts were made, but the results were inconclusive; this was possibly partly due to intensive sulphonamide therapy.

Haemoglobin estimations in some of the severely dehydrated infants were made on admission. Here again the findings were not helpful in the assessment of dehydration. Haemoglobin values (Sahli) ranged from 70 to 90% (average 80%), and did not confirm the clinical evidence of severe fluid loss and shock. In several of these cases an underlying, often severe, anaemia became apparent when fluid loss had been corrected. Haemoglobin estimations in 30 infants who, though no longer dehydrated, were not making satisfactory progress showed values of 100% in only 2 cases. In the remaining 28, investigated between 5 and 37 days after admission, haemoglobin values ranged from 42 to 88% (average 60%). These low haemoglobin levels appeared to be due to a multiplicity of causes, singly or in combination: (1) Previous microcytic anaemia, especially in the premature babies. (2) Effect of intensive sulphonamide therapy, although this was usually well tolerated. (3) Insufficient intake of food during the illness and convalescence. (4) Insufficient absorption of food, vitamins, and administered iron, due to changes in the intestinal mucosa even after cessation of diarrhoea. (5) Parenteral infection.

We found that the routine administration of iron, in the form of a ferrous sulphate mixture, combined with liberal allowances of vitamins, did much to accelerate convalescence and recovery. Infants showing haemoglobin values below 60% were given transfusions of 200 to 300 c.cm. of blood, often with dramatic improvement.

Treatment

This, as previously described (Alexander and Eiser, 1943), was based on the following principles:

1. The search for, and elimination of, foci of parenteral infection. Sulphonamides, chiefly sulphathiazole, were given in large doses (3 to 4½ g. daily for 5 to 7 days), and operative measures undertaken as required.

2. The adequate administration of fluids and food to meet the infant's daily requirements and to prevent the onset of dehydration, and as early a return to full-strength feeds as the infant would tolerate. On admission they were given half-strength Hartmann's solution by mouth for 12 to 24 hours. If vomiting had ceased, dilute milk feeds, 1:8 or 1:6 were then begun, and the strength of the feeds was gradually increased until the infant was taking a full-strength milk-feed, usually in 4 to 7 days. If vomiting persisted, all feeds were stopped and fluids were given parenterally. It

was our practice to give the infant the same kind of food as he had had before admission unless there was some definite contraindication. Vitamins A, B, C, and D were added to the feeds from the first day, and continued throughout the stay in hospital.

3. The early correction of fluid loss. Fluids and proteins were administered intravenously in the form of half-strength serum or plasma (diluted with Hartmann's solution) as soon as there was clinical evidence of dehydration, and in quantities sufficient to restore fluid loss and maintain the infant's daily requirements. The usual allowance of 2½ oz. per lb. per day was made, plus an allowance of 3 to 6% of body weight for dehydration in the first 24 to 48 hours. The intravenous drip was begun with half a bottle of Hartmann's + 2½ to 5% glucose, and serum or plasma then added (diluted to half-strength with Hartmann's). The drip was continued, giving alternate bottles of Hartmann's solution and half-strength serum or plasma, until dehydration was completely corrected and the infant was able to take and retain a dilute feed; this was generally in 1 to 3 days. Feeding was usually begun 12 to 24 hours after the commencement of intravenous therapy, and the quantity and strength of the milk feed gradually increased, the rate of the intravenous drip being adjusted accordingly.

4. Energetic measures to combat shock in those infants admitted in a state of collapse. Warmth, stimulants such as brandy and coramine, and oxygen were given, and the intravenous drip was begun immediately. Treatment in these cases was considered as urgent as in "surgical shock."

5. The combating of anaemia by routine administration of iron (in the form of a ferrous sulphate mixture) and blood transfusions as required.

6. The prevention of cross-infection; all infants were nursed in cell or barrier wards with strict bed-isolation technique, including the wearing of gowns and masks by all attendants.

Summary and Conclusions

One hundred and forty cases of diarrhoea and vomiting in infants under 15 months of age are analysed.

The cases were of average severity as judged by incidence and degree of dehydration; 69 (49.3%) were dehydrated, the maximum incidence of severity occurring in the age group 0–9 months.

There were 8 deaths, giving a case fatality of 5.7% for all cases, or 11.6% of dehydrated cases; 6 of the 8 deaths followed relapses.

There were 27 relapses. The relapse rate in the open "barrier" ward was four times that in the cell wards.

Evidence of parenteral infection was found in 124 cases, or 88.6%. The type of parenteral infection and incidence of infecting organisms are shown.

The changes in body chemistry in dehydration occurring in diarrhoea and vomiting are discussed, and the need for further research in this field is stressed.

The gratifying results obtained in this series may be attributed to: (1) the fact that the parenteral infections present were fairly easy to recognize and treat; and (2) the attention paid to the prevention or early correction of dehydration, and early return to full feeds and maintenance of nutrition. So long as the aetiology of this killing disease remains obscure, treatment of established diarrhoea and vomiting must be directed along these lines. Breast-feeding for at least the first 6 months of life remains our best-known prophylactic measure, combined with protection of the infant from exposure to infection.

We wish to express our thanks to the medical superintendent, Dr. W. Gunn, for facilities to carry out this investigation, and to the nursing staff for their unfailing co-operation. Our thanks are also due to the staff of the North-Western Group laboratory, by whom all the numerous bacteriological and biochemical investigations were performed.

REFERENCES

Aldridge, A. G. V. (1941). *Arch. Dis. Childh.*, **16**, 81, 182.
Alexander, M. B., and Eiser, Y. (1943). *Lancet*, **2**, 810.
Campbell, R. M., and Cunningham, A. A. (1941). *Arch. Dis. Childh.*, **16**, 88.
Heyl, J. T., and Janeway, C. A. (1942). *U.S. nav. med. Bull.*, **40**, 785.
Hickmans, E. M., Finch, E., and Tonks, E. (1943). *Arch. Dis. Childh.*, **18**, 96.
Himsworth, H. P., and Glynn, L. E. (1944). *Lancet*, **1**, 457.
Hoag, L. A., and Marples, E. (1931). *Amer. J. Dis. Child.*, **42**, 291.
Ravdin, I. S., *et al.* (1943). *J. Amer. med. Ass.*, **121**, 322.

R. D. Reid and L. H. Bronstein (*J. Amer. med. Ass.*, **1944, 124**, 703), who record an illustrative case in a boy aged 2 years, state that meningococcal conjunctivitis should be suspected in cases with Gram-negative intracellular diplococci in smears of pus from the eyes when there is no obvious source of the infection. The authors' patient recovered under sulphathiazole by mouth.

INHIBITION OF LACTATION BY HEXOESTROL DIPROPIONATE

BY

FREDERICK PRESCOTT, M.Sc., Ph.D., M.R.C.S.
Wellcome Research Institution

IN COLLABORATION WITH

MARGARET BASDEN, M.D., F.R.C.S., F.R.C.O.G.
Senior Honorary Obstetric Surgeon, Mothers' Hospital, Clapton; Surgeon, South London Hospital for Women and Marie Curie Hospital

Physiology of Lactation

In the physiology of lactation both hormonal and neurogenic factors are concerned. The development of the lobule-alveolar system of the glands of the breasts during pregnancy is influenced by the ovarian hormones, oestrogen and progesterone (Nelson, 1936). After delivery the initiation and maintenance of lactation depend upon the presence of the anterior lobe of the pituitary, since hypophysectomy late in pregnancy or after parturition inhibits post-partum milk secretion (Selye, 1934). A further factor in the maintenance of established lactation is a neurogenic one—namely, the act of suckling, which reflexly stimulates the release of a lactogenic principle from the anterior pituitary. The release of the latter principle occurs only after the inhibiting effect of oestrogen is withdrawn—that is, after delivery. Oestrogens in large doses are known to inhibit lactation (Folley, 1936; Folley and Kon, 1936); this they do probably by depressing the activity of the anterior pituitary. The absence of the suckling stimulus together with the administration of an oestrogen may therefore be expected to produce inhibition of lactation.

Methods used for Inhibiting Lactation

In the past the most common method used to prevent or suppress lactation was the application of a tight breast-binder, restriction of fluids, purgation, and removal of the infant from the breast. Many cases treated in this way had painful engorgement or tenderness of the breasts; moreover, neither the severe restriction of fluids nor purgation is wise in the early puerperium. Following the observation that large doses of oestrogens suppressed lactation in the experimental animal, natural oestrogenic hormones such as oestradiol were employed to inhibit lactation clinically, and after the introduction of the synthetic oestrogens these were almost exclusively used on account of their cheapness. The one most widely employed has been stilboestrol. There are many published papers on the use of this compound in the inhibition of lactation (Abarbanel and Goodfriend, 1940; Abarbanel and Klein, 1941; Barnes, 1942; Bloom, 1941; Connally *et al.*, 1940; Davis and Boynton, 1941; Mendel, Goldman, and Caire, 1941; Mucklé, 1940; Palmer, Martin, and Fulton, 1942; Stewart and Pratt, 1941). The general opinion is that for this purpose stilboestrol is just as effective by mouth as by injection. A study of these papers reveals that: (*a*) stilboestrol is less effective in women already lactating; (*b*) a course of treatment lasts usually four to five days, and sometimes for as long as six, seven, or even ten days, the dosage ranging from 5 mg. daily to 15 mg. t.i.d.; (*c*) initial success is often achieved in the first few days, but the breasts may fill up four to nine days later and further treatment is then necessary (Mucklé, 1940; Palmer, Martin, and Fulton, 1942). According to Connally *et al.* (1940) stilboestrol does not completely inhibit lactation, but delays its onset to the fifth or sixth day after delivery.

Hexoestrol has also been used for the inhibition of lactation (Bishop, *et al.*, 1940; Barnes, 1942). It is given orally in a similar dosage to stilboestrol, and seems to produce much the same result. Barnes (1942) states that, weight for weight, hexoestrol is less potent than stilboestrol for the inhibition of lactation: she, however, administered both substances orally. Campbell *et al.* (1939) claim that by injection hexoestrol is more potent than stilboestrol.

Other endocrines that have been used to inhibit lactation are dienoestrol (Barnes, 1942); trichlorethylene (Macpherson and Robertson, 1939; Haultain, 1942); testosterone propionate (Kurzrok and O'Connell, 1938; Siegler and Silverstein, 1940;

Duffy and Corsaro, 1941); methyl testosterone (Kushner, 1942; Lass, 1942); and octofollin (Murphy, 1943).

Use of Hexoestrol Dipropionate

It is well known that esterification of the oestrogens retards their rate of absorption and elimination and thus prolongs their action in the body (Miescher, Scholz, and Tschopp, 1938). Dr. G. Brownlee of the Wellcome Physiological Research Laboratories converted hexoestrol into the dipropionate and submitted it to pharmacological tests. He reported that by injection hexoestrol dipropionate was one and a half to three times more potent than hexoestrol when tested on ovariectomized immature rats. By mouth hexoestrol dipropionate was not as potent as hexoestrol weight for weight, but the duration of action was twice as long. As this report was encouraging, it was decided to try the effect of hexoestrol dipropionate clinically for the suppression of lactation. It was given to separate groups of women orally in tablet form and intramuscularly in oil; but it soon became apparent that orally it was not so effective as parenterally, and the oral route was abandoned. This confirmed Dr. Brownlee's pharmacological tests.

The patients treated were those in whom it was necessary to inhibit lactation because of stillbirth, abortion, neonatal death, or cracked nipples. No other treatment was given—i.e., the breasts were not bound up, no purgatives were used, and fluids were not restricted. Results, if any, were therefore due to treatment.

Effect of Hexoestrol Dipropionate given Orally

Twenty-three patients were given hexoestrol dipropionate orally in doses varying from 10 to 20 mg., three times daily. Treatment was started in 13 cases on the first day post partum, and in 10 on the second or third day. A successful result was taken to be one in which lactation was inhibited without breast engorgement or painful breasts on or before the third day of treatment. The results are analysed in Table I.

TABLE I.—*Analysis of Results of Oral Administration of Hexoestrol Dipropionate*

Total No. of Cases	Successful Result on 1st Day	Successful Result on 2nd Day	Successful Result on 3rd Day	Successful Result after More than 3 Days	Failures
23	2 9%	3 13%	4 17%	10 44%	4 17%
		39%			

Using the criteria given above, it will be seen that only 9 out of 23 cases, or approximately 40%, were successful. The average total dosage in the successful cases was 90 mg., with a range of 28 to 180 mg. A successful result on the first day was obtained in 2 cases. In 10 of the series (44%) it took more than three days to inhibit lactation, and in 4 cases (17%) treatment failed to inhibit lactation. No untoward results, such as nausea or vomiting, were observed. Five of the patients had full or engorged breasts in spite of treatment.

Effect of Hexoestrol Dipropionate given Parenterally

Forty-four cases were treated with hexoestrol dipropionate in oil by intramuscular injection. Repeated injections were tried at first, but it was eventually found that in most cases a single injection of 12.5 mg. was sufficient to inhibit lactation if given within three days of delivery. The results are summarized in Table II.

TABLE II.—*Analysis of Results of Intramuscular Administration of Hexoestrol Dipropionate*

Total No. of Cases	Success after 1 Day's Treatment (1 Injection)	Success after 2 Days' Treatment (2 Injections)	Success after 3 Days' Treatment (3 Injections)	Success after More than 3 Days' Treatment	Cases in which Treatment was Repeated	Failures
44	29 (66%)	2 (5%)	4 (9%)	8 (18%)	3 (7%)	1 (2%)

The day of the puerperium on which treatment was started did not seem to affect the results appreciably, as Table III shows.

TABLE III

Day of Puerperium Treatment Started	No. of Cases	Success after 1 Day's Treatment (1 Injection)	Success after 2 Days' Treatment (2 Injections)	Success after 3 Days' Treatment (3 Injections)	Success after More than 3 Days' Treatment	Cases given Second Course of Treatment	Failures
1st	12	8	—	—	4	—	—
2nd	17	11	—	2	3	3	1
3rd	8	7	1	—	—	—	—
4th	2	1	1	—	—	—	—
5th	2	1	—	—	1	—	—
18th	1	—	—	1	—	—	—
19th	1	—	—	1	—	—	—
21st	1	1	—	—	—	—	—
Totals ..	44	29	2	4	8	3	1
Percentage		66%	5%	9%	18%	7%	2%
			80%				

In five cases hexoestrol dipropionate was given after lactation had been established—namely, on the 5th, 18th, 19th, and 21st days post partum. In four cases lactation was suppressed on or before the third day, and in one case on the fifth day. Four cases required only one injection, and one case required two injections.

A small series of patients received 10 to 15 mg. of hexoestrol in oil as a control, but the results were no better than those obtained with stilboestrol or other oestrogens by mouth. Daily injections over a period of many days were necessary to inhibit lactation.

Conclusions

These results show that a single injection of hexoestrol dipropionate in oil inhibited lactation in 66% of the cases. The dose used was generally 12.5 mg. If a successful result is taken to be inhibition of lactation without breast engorgement on or before the third day after starting treatment, then 35 cases out of 44 (80%) were successful. Eight cases (18%) required treatment for more than three days, and there was one failure—a case in which the breasts were engorged and there was a slight flow of milk a fortnight after beginning treatment. A second course of treatment was needed in 3 cases only (7%). In no other cases were the breasts tender or engorged. With the suppression or inhibition of lactation the breasts became soft and comfortable. No unpleasant side-effects were observed in any of the patients. The results were vastly superior to those obtained with hexoestrol dipropionate by mouth. Administered by the latter route, a course given over several days was invariably necessary. In only 2 out of 23 cases (9%) was a one-day oral course effective in inhibiting lactation, and in only 9 cases (39%) was a three-days course effective.

Discussion

For the suppression of lactation hexoestrol dipropionate given by injection is superior to stilboestrol or hexoestrol by mouth or by injection. With stilboestrol and hexoestrol a course of several days' treatment is necessary, and a repeat course is often needed several days later owing to secondary filling. Thus Mucklé (1940) found that 40% of his 200 cases given a course of stilboestrol by mouth required a second course; Connally *et al.* (1940) found suppression of lactation with stilboestrol incomplete; and Barnes (1942) states that a quarter of her cases receiving stilboestrol required a repeated course of treatment. Stilboestrol is also not effective in women already lactating (Stewart and Pratt, 1941). In five of the cases recorded in the present paper one or two injections of hexoestrol dipropionate suppressed established lactation in a few days. According to Barnes (1942), dienoestrol and hexoestrol are not as effective as stilboestrol in inhibiting lactation.

Testosterone and methyl testosterone are stated to be more effective than stilboestrol. Duffy and Corsaro (1941) claim that 50 to 75 mg. of testosterone, in 25-mg. doses, inhibits lactation in 24 to 48 hours if given within the third or fourth day of delivery, but is ineffective on the first day or when lactation is established. The same authors gave methyl testosterone orally in 25-mg. doses four-hourly for two days with similar results. Kurzrok and O'Connell (1938), however, found that 70% of their cases required two daily injections of 10 to 25 mg. of testosterone dipropionate for periods of from three to seven

days. This period was decreased if doses of 25 to 50 mg. were given (Birnberg, Kurzrok, and Klor, 1940). Siegler and Silverstein (1940) inhibited lactation by giving total doses of 25 to 125 mg. of testosterone dipropionate in divided doses every 12 hours, with a total of three to five injections. Lass (1942) states that methyl testosterone in repeated doses of 25 mg. inhibits lactation in 48 hours; total dosage was from 250 to 350 mg. In 7 out of 25 cases methyl testosterone was effective on the first day.

A new synthetic oestrogen—octofollin or 2:4-di-(*p*-hydroxyphenyl)-3-ethyl hexane—has recently been used for the inhibition of lactation (Murphy, 1943). This, given over a period of four days in doses of 5 m.g. t.i.d., yields results similar to those obtained with stilboestrol.

From this discussion it is clear that hexoestrol dipropionate given parenterally is more effective for the inhibition of lactation than the other synthetic oestrogens and testosterone or its derivatives. With the possible exception of methyl testosterone none of these is effective in inhibiting lactation on the first day of treatment. The use of synthetic androgens in high dosage is ruled out on the grounds of expense.

Summary

A single intramuscular injection of 12.5 mg. of hexoestrol dipropionate inhibited lactation in 66% of a series of 44 mothers shortly after childbirth. When given within the first three days of delivery lactation did not occur, and there were no signs of breast engorgement or discomfort. Of the remaining 34% all but 2% ultimately responded to repeated injections. Only 18% required treatment for more than three days.

A further course of injections, given to suppress "secondary filling," was necessary in only 7% of the cases. This compares well with the figure of 25 to 45% for stilboestrol.

Hexoestrol dipropionate, given intramuscularly in one or two doses, was effective in suppressing lactation in five cases in which it had already been established.

Hexoestrol dipropionate given by mouth is not so satisfactory as when given by injection.

Literature on the inhibition of lactation by oestrogens and androgens is reviewed.

Thanks are due to the members of the resident medical staff of the Mothers' Hospital, Clapton, for their assistance and care in keeping records of the cases.

REFERENCES

Abarbanel, A. R., and Goodfriend, M. J. (1940). *Amer. J. Obstet. Gynec.*, **40**, 1037.
—— and Klein, M. D. (1941). *N.Y. St. J. Med.*, **41**, 383.
Barnes, J. (1942). *British Medical Journal*, **1**, 601.
Birnberg, C. H., Kurzrok, L., and Klor, S. J. (1940). *Amer. J. Obstet. Gynec.*, **39**, 107.
Bishop, P. M. F., *et al.* (1940). *Lancet*, **1**, 629.
Bloom, O. H. (1941). *Amer. J. Surg.*, **54**, 443.
Campbell, N. R., *et al.* (1939). *Lancet*, **2**, 312.
Connally, H. F., *et al.* (1940). *Amer. J. Obstet. Gynec.*, **40**, 445.
Davis, M. E., and Boynton, M. W. (1941). *J. clin. Endocrinol.*, **1**, 339.
Duffy, P. V., and Corsaro, J. (1941). *J. Amer. med. Ass.*, **116**, 33.
Folley, S. J. (1936). *Biochem. J.*, **30**, 2262.
—— and Kon, S. K. (1936). *Proc. roy. Soc.*, B, **124**, 476.
Haultain, W. F. T. (1942). *Edinb. med. J.*, **49**, 73.
Kurzrok, R., and O'Connell, C. P. (1938). *Endocrinology*, **23**, 476.
Kushner, J. I. (1942). *J. clin. Endocrinol.*, **2**, 345.
Lass, P. M. (1942). *Amer. J. Obstet. Gynec.*, **43**, 86.
Macpherson, A. I. S., and Robertson, E. M. (1939). *Lancet*, **2**, 1362.
Mendel, E. B., Goldman, A. M., and Caire, A. (1941). *Amer. J. Obstet. Gynec.*, **42**, 528.
Miescher, K., Scholz, C., and Tschopp, E. (1938). *Biochem. J.*, **32**, 141, 725.
Mucklé, C. W. (1940). *Amer. J. Obstet. Gynec.*, **40**, 133.
Murphy, J. A. (1943). Ibid., **46**, 146.
Nelson, W. O. (1936). *Physiol. Rev.*, **16**, 488.
Palmer, A., Martin, P. L., and Fulton, L. (1942). *Clinics*, **1**, 750.
Selye, H. (1934). *Amer. J. Physiol.*, **107**, 535.
Siegler, S. L., and Silverstein, L. M. (1940). *Amer. J. Obstet. Gynec.*, **39**, 109.
Stewart, H. L., and Pratt, J. P. (1941). Ibid., **41**, 555.

The 208th session of the Royal Medical Society of Edinburgh will open on Friday, Oct. 13, with an inaugural address by Lord Moran, P.R.C.P., on "The Anatomy of Courage." Other addresses will be given on Oct. 27, by Sir Joseph Barcroft, on "Problems in Foetal Life"; on Nov. 10, by Sir Alexander Fleming, on "Penicillin"; on Nov. 24, by Prof. J. H. Gaddum, on "The Discovery of New Remedies"; on Jan. 12, by Sir John Boyd Orr, on "The Future of Medicine"; on Jan. 26, by Lieut.-Gen. Sir Alexander Hood, on "The Army Medical Services in Peace and War"; on Feb. 2, by the Right Hon. Walter Elliot, on "Medicine and the State"; and on Feb. 16, by Col. J. C. Kimbrough, U.S. Army Medical Corps, on "Wounds of the Genito-urinary Tract in Modern Warfare."

FACTORS INFLUENCING DERMATITIS IN COAL-MINERS

BY

R. B. KNOWLES, M.D.

Many of the dermatoses to which miners are subject may occur in any person, whatever his trade, but some are directly or indirectly associated with the conditions under which these men work. The latter forms may be divided into two main groups: (I) those due, in the main, to trauma and infection, which might be called "the stigmata of miners"; (II) cases of dermatitis in the usually accepted sense, including occupational dermatitis.

Group I

The blue-black scar present on the skins of most miners is due to the fine particles of coal-dust which enter a wound at the time of injury. Callosities on the hands are common, and are to be seen across the heads of the metacarpals and on the inner side of the thumb, where the tools set up constant friction. The boots cause thickenings of the skin on the front and back of the ankle.

Bursae, true and false, play a part in the infections and injuries to which coal-miners are liable. False bursae may occur along the heads of the metacarpals, producing, when infected, the "beat-hand" of the miner. Bursae at the patella and olecranon may become the "beat-knee" and the "beat-elbow." Foreign bodies between the knee-pads and the skin sometimes help in the production of "beat-knee."

These infections are not likely to occur without some abrasion of the skin, which allows the entry of bacteria and provides a medium suitable for their growth. Various kinds of pyodermia may thus be produced either by staphylococci (boils, pustules, folliculitis, subcutaneous abscesses, and ulcers) or by streptococci (vesicles, bullae, impetigo, ecthyma, with lymphangitis and cellulitis, onychia, and whitlow). "Infected abrasions" are a very common condition among miners. Acid burns on the buttock, caused by the leakage of sulphuric acid from the lamp-battery, are also seen.

Group II

Clinically, acute cases are often eczematous, and chronic cases, as a result of constant irritation and scratching, may become lichenified. Starting with erythema, the dermatitis may become vesicular, weeping, scaly, papular, pustular, and follicular. Occasionally there is fissuring of the palm. The chief symptoms are itching, soreness, and pain.

Most of these cases of dermatitis involve chiefly the hands and forearms, the feet and legs; but some begin on the trunk and others attack the trunk after starting elsewhere. Sometimes an intertrigo occurs in the axillae or groins, or between the toes. Encouraged by moisture, heat, and friction, streptococci produce this intertrigo of the skin; or it may be due to a monilial infection and occur in the gluteal folds. In coal-miners, intertrigo may also be found on the outside of the forearm and the inner part of the thigh, as the result of constant friction of the arm against the thigh when using pick and shovel.

An eczematous eruption in the external auditory meatus may be caused by particles of stone and coal falling into the ear which is uppermost when a collier is in the reclining position.

There are few miners who do not wear a belt, and friction between this and the skin may determine the onset of a dermatitis around the lower abdomen. Fungous infection of the feet has recently become prevalent, and its spread appears to be facilitated by pit-head baths. It is more common in the summer months, and occurs in three principal types: (*a*) Sodden white skin between and underneath the toes, especially in the fourth interdigital cleft. The infection may spread and produce pustules on the soles of the feet. (*b*) Superficial scaling of parts of the hands or feet. (*c*) An eruption of deeply set vesicles on the soles of the feet: this is the most common type. The infection may also spread to the groins, to produce tinea cruris; the axillae, perineum, natal cleft, and thighs may be involved.

Improper treatment of wounds or skin lesions—e.g., by sulphur ointment, iodine, or antiseptics—may produce dermatitis.

Cleansing agents which are used to remove dirt and dust may be irritant to the skins of some miners, and a dermatitis may ensue; excessive use of soap may be the cause. Oil employed on coal-cutting and boring machines may set up a dermatitis, or paraffin used to remove oil may act similarly. Prolonged or repeated contact with oil may produce oil acne. Creosote dermatitis has been found among coal-miners from handling creosoted props: the hands, wrists, face, and neck are affected with a pustular eczema.

During the last few months I have visited nine pits in order to obtain information about the factors involved in the causation of dermatitis in coal-miners. The conclusions reached are the result of personal observations and discussions with colliery officials and workmen, of experience in general practice in a mining community, and of attending the skin department of the Chesterfield and North Derbyshire Royal Hospital.

These pits employ 7,700 men, and the number of cases of dermatitis certified over a period of two years was 56, a percentage of 0.70—the incidence in the separate pits varying from 0 to 1.8%. The accompanying table gives various details of

Table showing Details of 9 Pits, including Incidence of Dermatitis

Pit	Depth (yards)	Month	Dry-bulb Temp. (° F.)	Wet-bulb Temp. (° F.)	Relative Humidity	% Dermatitis in 2 Years	Height of Coal Face	No. of Men Employed	Distance Coal Face from Shaft (miles)	Pit-head Baths	Fungus Infection of Feet Reported
A	158	Dec.	60	58	88	0·6	5′ 0″	300	1⅜	No	No
B	365	,,	70	69	94	0·8	3′ 3″	700	1¼	Yes	No
C	330	,,	63	60	82	0·3	4′ 0″	1,600	1½	Yes	No
D	170	,,	50	49	93	0·17	3′ 3″	600	1½	No	No
E	170	Jan.	58	57	93	0·2	3′ 3″	500	1⅜	No	No
F	720	,,	81	71	56	1·8	4′ 3″	1,300	2	Yes	No
G	700	May	71	62	59	0	4′ 6″	650	1¼	Yes	Yes
H	640	,,	62	57	72	0·83	3′ 6″	1,200	1⅝	Yes	Yes
I	800	,,	74	70	79	0·11	4′ 6″	850	2	Yes	No

the pits visited. The hygrometer readings are those in the return airway after the air has circulated along the coal face.

The pits vary in depth and in working conditions. D and E are very wet; the others are on the whole dry pits, water being found only in certain districts in C and H. F is a hot deep pit, and the coal face is two miles from the shaft. All except three have pit-head baths, and the incidence of dermatitis in these three is not high. An outstanding point is that in F the incidence of dermatitis is more than twice as high as that in any of the other pits: it is significant that it is the hottest pit.

Aetiology

The chief factors influencing the nature and cause of dermatitis in coal-miners are:

1. *Factors due to Pit Conditions.*—(*a*) The ventilation of the pit: temperature; humidity; height of coal face; distance of coal face from shaft. (*b*) The presence of water and the substances dissolved in it. (*c*) The quantity, quality, and state of subdivision of dusts and the effect of machinery on these.

2. *Factors due to the Mental and Physical Constitution of the Workmen.*—(*a*) Behaviour in relation to trauma and infection. (*b*) The presence of skin conditions—seborrhoea, hyperidrosis, ichthyosis—which may predispose to dermatitis.

3. *Friction between skin surfaces or between clothes and the skin.*

4. *The use and abuse of cleansing agents and popular skin applications in general.*

Pit Conditions

Ventilation.—Of paramount importance is the ventilation of the pit: on this depend the temperature and the amount of sweating. Dermatitis appears to be more common in deep hot pits, where sweating is profuse and the air current does not evaporate the sweat from the body.

Humidity.—The factor next in importance is the humidity of the atmosphere. The amount of sweating depends to some extent on this, for, at a given temperature, the higher the relative humidity of the atmosphere the less will be the evaporation of sweat. A man's capacity for work is greatly impaired when the wet-bulb temperature exceeds 82° F., and even at a wet-bulb temperature of 72° F. inconvenience is felt unless only light clothing is worn. It may be possible to do a fair amount of work at wet-bulb temperatures above 82° F. if air at a good velocity is kept blowing over the exposed surface of the miner, but the limit is 85° F. It seems that the dry-bulb temperature is of secondary importance, as a case is recorded in which the man—working devoid of clothing—experienced little inconvenience in a temperature of 95.5° F. dry-bulb and 74° F. wet-bulb (Penman and Penman, 1927).

Height and Distance of Coal Face.—Two other factors are the height of the coal face and the roof in general, and the distance of the coal face from the shaft. A shallow coal face makes the working conditions more difficult; walking in a pit the roof of which is low produces more sweating and increases the amount of friction on the body surface. The temperature at the coal face depends to some extent on the distance of the latter from the shaft.

Presence of Water.—Pit-water, and mineral salts and organic matter dissolved in it, play a part in the production of some cases of dermatitis. Pits D and E are very wet, but have a low incidence of dermatitis and a high one of fibrositis and myositis; in these pits the men are exposed to water under foot and from the roof. But the pits are shallow, and the water is mainly from the surface and has not percolated through much depth of soil and rock. On the other hand, water in a deep pit has a higher concentration of salts and seems to be more irritant. In pit H men had more irritation and smarting of the skin when working in a wet part.

Dusts.—Dust is produced in large quantities in coal-mines—probably more so since the introduction of machinery. Limestone dust is also strewn in the roadways. In the mines, dust collects on the face, trunk, hands, knees, ankles, and between the toes. Friction between skin surfaces or between clothes and the skin rubs dust in: it is not usual for dermatitis in miners to begin on the trunk above the line of the belt. More often it begins on the hands and forearms, or legs and feet, and particularly at the boot-top level; or, if on the trunk, in the region where the trousers or shorts are held in contact with the skin. In these places there is friction. During the exit from the pit all these factors—sweating, dust, and friction—are in operation. The quantity of dust can be reduced by having a fine spray of water operating where dust is produced in large quantities (coal-cutting machines, borers, and at the loader-end).

The Constitutional Factor

Since the majority of coal-miners are not prone to occupational dermatitis, some other causal factor must be inherent in the sufferers themselves. Intelligence, behaviour, general health, and the texture and natural qualities of the skin may determine whether a dermatitis occurs, and, if it does, may modify the type of dermatitis produced. Men with thick, dark, oily skins are, as a rule, less susceptible than those with fair, thin, dry skins. Those with relatively hairless skins are less liable to folliculitis from oils and grease than those with hairy arms and legs. Ichthyosis predisposes to dermatitis. A seborrhoeic skin is greatly affected by sweating, and seborrhoeic dermatitis is not uncommon among miners. Hyperidrosis may be a potent factor in the causation of dermatitis.

In other cases dermatitis is caused by cleansing agents, or applications of ointments or antiseptics to some existing skin lesion.

Conclusion

Dermatitis in coal-miners, then, is not due to any single cause; it is the summation-effect of many factors, some of which are provided by the conditions of work and others by the constitutional make-up of the men. The prophylaxis of dermatitis in coal-miners depends on avoiding the causes, so far as is possible. The chief points in prophylaxis are:

1. Adequate ventilation of the pit is essential.
2. The quantity of dust must be reduced to a minimum.
3. Water, if possible, ought to be pumped away.
4. Education of the miner by:

(*a*) Notices posted at the pit telling him to report any suspected dermatitis at its onset; (*b*) instruction of ambulance attendants on how to treat such cases—e.g., application of protective lotion;

(*c*) warnings of the possible effects of unsuitable cleansing agents and home remedies (good soaps, vegetable oils, and liquid paraffin allowed); (*d*) emphasis on the advantages of cleanliness.

5. Selection of suitable personnel for work in the pit.

6. Application of protective substances to the skin.

7. Warnings of the increased risks of working when ill or insufficiently recovered from illness.

8. Prevention of fungus infection of the feet—a difficult matter: (*a*) New workers should be examined before they are admitted to the baths. (*b*) To prevent contact between the feet and the bath floors, slippers should be worn and sterilization of these be periodically carried out. (*c*) Infected men should have separate baths.

My thanks are due to the University of Sheffield for permission to publish this article, which is an abstract of a thesis; to the managements of the collieries I visited; and to Dr. Rupert Hallam, dermatologist to the Chesterfield and North Derbyshire Royal Hospital, for his helpful suggestions.

REFERENCE

Penman, D., and Penman, J. S. (1927). *A Treatise on Mine Ventilation*, p. 86. London.

INTRAVENOUS ANAESTHESIA

CONTINUOUS POSITIVE-PRESSURE DRIP SALINE WITH INTERMITTENT PENTOTHAL

BY

W. M. MAIDLOW, M.R.C.S., D.A.
Major, R.A.M.C.

Many articles have recently appeared on pentothal anaesthesia with drip-feed continuous saline, and each of the various methods has its advantages and disadvantages.

Criticisms of Previously Described Methods

Drs. Roberts and Sellick (1944) have answered Mr. O'Connor (1944) satisfactorily, by stressing the fact that the metal stand used in the gravity technique is both cumbersome and often in the way of the surgeon or assistant. A further disadvantage of this method is seen when the operating table has to be moved during the operation—as, for example, during a meniscectomy, when the surgeon, having been operating with the leg bent over the end of the table and the light shining over his shoulder into the joint, starts to sew up with the leg straight and the light directly overhead. This entails moving the whole table some distance, so that the drip has to be moved also. Care has to be taken not to dislodge the needle or connexions as the tubing sways, the container has to be steadied in case it becomes unhooked or is broken, and at the same time the anaesthetic machine, if in use, has to be moved also.

Dr. Griffin (1944) overcomes this difficulty to a certain extent by affixing the drip-container to a bar on the Boyle's table model. This type of machine is, however, by no means universal, and I for one would hesitate to make such an alteration to a McKesson machine or to my own portable apparatus.

Mr. O'Connor had criticized the apparatus described by Drs. Roberts and Sellick (1943) by suggesting that leakage of blood may occur back from the vein during intervals of injection or if the pressure in the saline bottle should drop. Drs. Roberts and Sellick counter this criticism by saying that a clip can be fixed distal to the bellows to prevent leakage of blood back. They point out that the ideal method is to use a flow of oxygen to produce the necessary pressure. Besides being wasteful, I cannot quite see why a minor explosion does not occur in the saline bottle when the tubing is pinched to admit the pentothal, unless the oxygen supply is turned off during this procedure, thus adding an extra manipulation. This could, of course, be avoided by fitting an automatic mercury manometer or blow-off valve; but this only adds further complications and, to my mind, disadvantages. It is my intention to describe a simple method that will obviate these difficulties, still employing the bellows method of producing pressure for the drip.

Having used the gravity method for a considerable time, I decided to try the positive-pressure method, when I was confronted with the difficulty of having no stand on which to hang my saline reservoir, and by the fact that I had been anaesthetizing for a fairly large series of meniscectomies (sometimes 6 in a morning) and becoming more and more tired of lugging a heavy metal stand to different positions. Also people in the theatre frequently tripped over the metal base. I had a mental picture of the surgeon one day stepping back and losing both his balance and his dignity.

There are a number of disadvantages in using the technique described by Drs. Roberts and Sellick.

1. Constant pricking of the tubing raises the question of sterilizing the puncture site at every injection, with consequent delay at a time when the patient requires a further dose immediately.

2. The need to pinch the tubing to avoid backwash, thereby possibly obscuring the drip chamber, means that the anaesthetist's hand is taken from the patient's jaw and his attention from the general condition.

3. Towels that may be in the vicinity of the operation have to be touched, and are perhaps disarranged, which may interfere with the surgeon or assistant.

4. The question where to place the syringe during intervals between injecting and the question of the sterility of the needle.

5. The eventual destruction of the rubber tubing (it is better to have thin-walled tubing, as it is lighter on the needle), with consequent leakage, which seems to occur most often at the start of a new case, thus not setting out with a 100% efficient system.

The aspiration indicator described by Drs. Roberts and Sellick is a most useful adjunct after induction of the patient in his bed or on a stretcher; with it we can be quite sure the needle is in the vein when making the puncture on the operating table. I have, however, made it a rule to avoid all extra glass tubes, indicators, adapters, and wire bindings which perish the tubing, so as to minimize leakages from the system.

Regarding Dr. J. L. Griffin's method, the main disadvantages seem to be:

1. The apparatus in cumbersome to sterilize.

2. The risk of breakage opens up the question of expense and possible difficulty in replacing the containers immediately.

3. The length of tubing necessary.

4. The U-tube method, with two containers and one drip chamber, makes it difficult to estimate the exact dose that is required immediately. There must be some delay while the saline in the tube distal to the drip is run through, and the surgeon does not wait before exciting any strong stimulus, which may not have been adequately anticipated. Again, the patient, having been placed at a required depth, will proceed to become a certain degree deeper when the saline is readmitted, from the pentothal still remaining in the tubing. This allows an error to occur in the estimation of dosage. I note, however, that Dr. Griffin uses 2½% solution and analeptics, and tubing of very narrow bore; but the margin of error still remains, and can be entirely overcome by the method described below.

An Effective and Simple Method

To overcome the above disadvantages I now use a three-way tap, which is situated close to a needle of medium length to facilitate removal of the syringe. One hand turns the tap, which is easily found even if covered with towels, and the same hand injects the pentothal, which is therefore admitted almost at the site of venepuncture, thus entirely overcoming all question of dead space. At the same time the flow of saline automatically ceases, and there can be no backwash or leakage up any tubes. The third arm of the tap runs to a reserve supply of pentothal in a gallipot slung in a ring on a metal stand. This stand is clamped to the arm-rest or a table, if the leg is being used, and consists of an upright metal bar about 6 in. high, on top of which is a platform holding the metal clip from the box in which all Record syringes are supplied. The 20-c.cm. syringe rests in this, and is quite secure and out of the surgeon's way. The syringe here comes easily to the hand of the anaesthetist, who remains seated at the head. About 6 in. of narrow-bore thin-walled tubing runs from an adapter on the syringe to one arm of the three-way tap. Another arm carries the tubing from the drip bulb and bottle; a metal sinker holds the tubing in the reserve pentothal supply.

There is one slight theoretical disadvantage when using the positive-pressure technique—namely, on turning the tap to inject pentothal the drip saline continues unless the clip proximal

to the drip is turned off. This, however, requires an extra movement of the hand, with consequent delay. In practice I have never seen the drip chamber fill up during this procedure—in fact, I keep the meniscus of saline right at the bottom of the drip chamber all the time, and see no use for the employment of a side-tube and clip. Here I must admit that the turning of the three-way tap does in one motion cut off the drip in the gravity method. I insert an air filter similar to those found on the Bristol blood sets, fitted between the bellows and the saline bottle. This may hold up certain bacteria which might otherwise reach the saline.

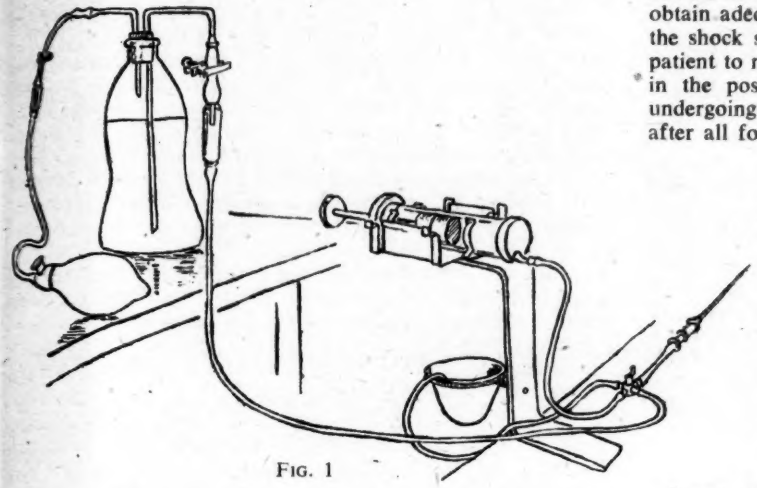


FIG. 1

The great advantage of this method is that it is only necessary to sterilize the metal rods which pierce the rubber bung (which is encased in sterilized "cellophane"), the drip chamber, and tubing. I have these autoclaved after every operation session in which they have been used. All I need to change between cases is the needle. Bottles containing sterile normal saline are stored ready.

With this technique an accurate dose can be administered immediately with the least amount of effort or movement by the anaesthetist, and if the operating table has to be moved, all that he need move is the table on which the bottle stands, which may also be the anaesthetic machine in the case of Boyle's table model. It is important to ensure that the rubber bung, the rods piercing it, and all joints are airtight.

Strength of Solutions Used.—I see no advantage in inducing with one strength—say, 5%—and continuing with 2½%, which, as Drs. Robert and Sellick point out, only confuses the estimation of dosage. I use 5% all the time for fit cases, and 2½% all the time for weaker or shocked patients, or for longer cases with a minimum of trauma—as, for example, in the application of a plaster-of-Paris spica.

Use of Analeptics.—I consider the use of analeptics during the operation, besides predisposing towards post-operative vomiting, an admission of lack of faith in the technique: the maintenance of blood pressure, amplitude of respiration, and oxygenation must be ensured by an adequate airway and the use of oxygen and/or supplementary nitrous oxide (see below).

Technique.—In practice, pressure is raised, the bellows clip tightened, and saline run through to the three-way tap; the flow is then stopped, pentothal is run through from the syringe to the three-way tap, and the syringe is refilled from the reservoir. In the Army it has been my practice to induce all patients on the operating table with their arm outstretched and bandaged down in position on a pillow on the arm-rest. Ill patients or those with severe painful fractures are induced in their beds, the syringe being removed and a fresh puncture made when they are in position. Here the aspiration indicator would be useful, but without proper adapters I found that glass tubing with two rubber joints very quickly became leaky. As soon as induction is complete and the patient is at a depth suitable for the proposed operation the syringe is removed, the three-way adapter connected to the needle, and the saline drip begun. Pentothal is added at fairly frequent intervals at the start, in 1 to 2 c.cm. doses and, later on, at much longer intervals.

Uses and Limitations of Intermittent Pentothal and Importance of Supplementary Anaesthesia

Concerning the use of oxygen and supplementary anaesthesia, oxygen alone, except as a resuscitative measure, is not satisfactory, as very much larger doses of pentothal are required, and I aim at keeping the total dosage of that drug below 2 g. If the operation is likely to be long I always use N_2O+O_2 to supplement and cut down the dosage of pentothal. I do not start supplementary anaesthesia until the operation is well under way—say, 15 minutes—and the patient is well settled; then I add N_2O+O_2, preferably with partial rebreathing and not closed-circuit technique, and add just enough pentothal to obtain adequate relaxation and quiet breathing, and to cut out the shock stimuli from the surgical trauma. This enables the patient to move his "bases" adequately, and is of great benefit in the post-operative condition, especially of Army patients undergoing herniorrhaphy, in which "chests" are so common after all forms of anaesthesia.

I consider operations of longer duration than 1½ hours generally to be unsuitable for pentothal, as are also those in which there is considerable surgical trauma and strong stimuli are evoked which would necessitate larger doses of the drug, causing it to produce its cumulative effects and give it the status of the long-acting barbiturates with their marked post-operative depression. I noticed this particularly in three cases recently—viz., nephrectomy (heavy stimuli and degree of relaxation required for exposure and delivery); colporrhaphy (duration of operation and surgical stimuli); colostomy (weakened condition of patient).

In my experience this form of anaesthesia is also unsuitable for abdominal explorations and for appendicectomies in robust individuals: here a spinal block, regional block, or cyclopropane is the best method of achieving the relaxation required. It is highly suitable for all orthopaedic cases of less than 1½ hours' duration—skin grafts, nerve explorations, and tendon suture operations, herniorrhaphies, Trendelenburg's operation for varicose veins, traumatic surgery, lacerations of scalp, and possibly for women and young adult "abdominals."

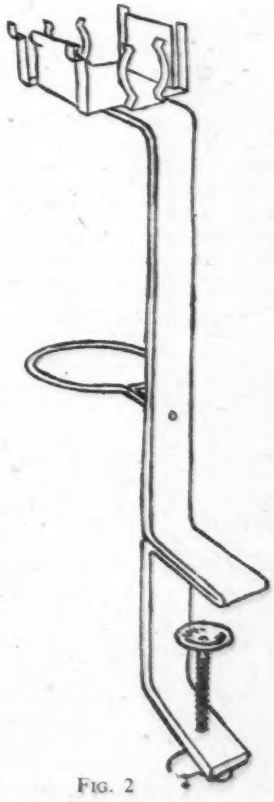


FIG. 2

I have used intermittent pentothal with a saline or glucose drip for very long operations such as cholecystectomy, gastrectomy, anastomotic operations, and Gallie's herniorrhaphies performed under spinal analgesia. This may stimulate reprisals, but I would stress the fact that in these cases it is used in absolutely minimal doses simply to keep the patient asleep where control by N_2O+O_2 may be difficult, or where premedication is wearing off and cyclopropane is contraindicated owing to its depressant respiratory action. For craniotomies also it may be useful when avertin is wearing off and lipoid-soluble supplements to N_2O+O_2 are inadvisable.

Figs. 1 and 2 are diagrams of this apparatus, which has proved efficient and simple, and for which I claim no originality, since it has been culled from the numerous and varied ideas of other authors writing on the subject.

REFERENCES

Griffin, J. L. (1944). *British Medical Journal*, **1**, 425.
O'Connor, J. F. (1944). Ibid., **1**, 199.
Roberts, F. W., and Sellick, B. A. (1943). Ibid., **2**, 813.
—— —— (1944). Ibid., **1**, 302.

SYMPATHETIC BLOCK

PROPOSED THERAPY IN TRAUMATIC SHOCK

BY

D. ENGEL, M.D., F.R.C.S.Ed.

Medical Superintendent, Staincliffe County Hospital, Dewsbury

The purpose of this paper is to draw practical conclusions from recent experiments (Engel and Forrai, 1943; Engel, 1943) and to propose regional sympathetic block as a preventive and curative method in cases of extensive crush injuries. Though my proposal is based on animal experiments there is enough clinical evidence to support my views.

The result of the experimental work can briefly be summarized as follows: In "traumatic shock" the rate of filtration through the capillaries in tissue adjacent to trauma, and probably also in the traumatized tissue itself, is greatly increased in the first 1 to 5 hours following trauma, and reduced afterwards. The increased rate of filtration, suggesting increased capillary permeability, is thus restricted to the traumatized area and is not generalized over the whole body. It was further shown that by regional sympathectomy it is possible to reduce considerably the increased rate of filtration caused by trauma.

These results were obtained by a new method consisting of a constant intravenous infusion of a dye and a simultaneous perfusion of the two knee-joints with Ringer solution under various conditions. The dye appearing in the perfusate passes through the "articular barrier"—i.e., the capillary endothelium, the synovial membrane, and the thin layer of tissue or space between the two.

The practical significance of these experiments is that if it is true that capillary permeability is one of the most important initiating factors in the development of "shock," then every procedure that is capable of reducing capillary permeability is bound to have a beneficial effect.

Technique

The simplest and most practical way of paralysing sympathetic action and thus reducing capillary permeability in the traumatized area without damaging the patient is the paravertebral infiltration of the regional ganglia with novocain. This should be carried out as soon as possible—in any case, within the first 1 to 3 hours after trauma. We have seen that the period of increased capillary permeability lasts only 1 to 5 hours, to be followed by a period of decreased permeability. No effect can therefore be expected after 5 hours. These results were obtained in the cat; it is therefore possible that the time limits mentioned do not apply exactly to human beings.

An anaesthetic of short effect, preferably novocain, should be used, because the second period of decreased permeability does not develop in the sympathectomized limb, and it is very likely that a prolonged sympathetic block may have a similar effect to that of sympathectomy and fail its purpose. If the lower extremity is crushed the first to fourth lumbar and the first sacral ganglia, if the upper extremity is involved then the stellate and the first and second thoracic ganglia, have to be injected. About the technique of the sympathetic block nothing more need be said; it is standard method.

Observations in the Literature

I have no personal experience of sympathetic block as a prophylactic or curative method against shock. There are, however, numerous clinical observations which support the usefulness of this method.

Several authors (Philipowicz, 1942, and others) reported on the excellent results obtained by sympathectomy in cases of frostbite. The inflammatory exudate and odour diminish immediately after operation, the moist gangrene becomes dry, and the demarcation is accelerated.

It is also a well-known fact that abdominal operations performed under lumbar or splanchnic anaesthesia cause much less shock than those under general anaesthesia, in spite of the falling blood pressure, which would be expected to favour the development of shock. The fact that shock does not develop so readily under lumbar and splanchnic anaesthesia is possibly due to the reduced capillary permeability in the abdominal tissues, temporarily excluded from sympathetic innervation.

The idea that the sympathetic has an influence on the development of traumatic shock is not new. The literature on the subject has been reviewed up to 1941 by Harkins (1941). We shall therefore consider here only the most important papers which have some bearing on capillary permeability. It was Cannon (1923) who first suggested that the hyperactivity of the sympathetico-adrenal system, excited by sensory-nerve impulses, is an important factor in traumatic shock. This theory was based partly on clinical observation, partly on experiments showing that continuous sympathetic stimulation or hyperadrenalinaemia led to a decreased blood volume and low blood pressure. It was assumed that a prolonged arteriolar constriction resulted in a capillary anoxaemia with consequently increased permeability, fluid loss, and final shock.

The effect of adrenaline in various concentrations on blood pressure, blood volume, haemoglobin concentration, etc., was examined by several authors. Freeman and co-workers (1936, 1941) produced a prolonged hyperactivity of the sympathetic nervous system by injecting adrenaline in physiological doses or by spontaneous emotional activity of the pseudaffective state. Both procedures resulted in a decreased circulating blood volume. This decrease did not occur when the vasoconstrictor action of the sympathetic was inhibited by ergotoxine, or when the emotional hyperactivity of the pseudaffective state was produced in a totally sympathectomized cat. Freedman and Kabat (1940) could not confirm all the results and conclusions of Freeman; they did not, however, rule out the possibility that sympathetic hyperactivity may play a part in shock following haemorrhage and fluid loss.

The experiments of Slome and O'Shaughnessy (1938), as well as those of Lorber *et al.*, emphasize the importance of the nervous factor in the development of traumatic shock. Either they severed the limb from its nervous connexions (nerve section, spinal section, spinal-cord destruction, spinal anaesthesia) or they severed the limb from everything except its peripheral nerves. The significance of the nervous "factor" became evident from both these series of experiments, but neither has taken the fact into consideration that the three spinal nerves of the lower limb—the femoral, sciatic, and obturator nerves—carry the bulk of its sympathetic nerve supply. It is therefore not clear from these experiments how much of the recorded effect was due to sympathetic action or inaction.

Lena Stern (1942) recently reported good results by stimulating the sympathetic centres and lowering the parasympathetic tone. She injected potassium phosphate direct into the cerebrospinal canal in all those cases in which a fall of blood pressure, a lowering of cardiac activity and respiration, etc., were manifest. Stern saw all these signs disappear, in men and in experimental animals, by her method. Her treatment is based on the view that "the sympathetic and parasympathetic nervous centres play the most important part in the production of shock." She warns against the use of potassium phosphate "in cases in which there is increased excitability of the sympathetic nervous centres, such as sometimes occurs in the first stage of shock"; potassium phosphate should be given only in the second stage.

It is not possible fully to co-ordinate the experimental and clinical results of Stern with my own; the following suggestions seem, however, to be justified. The first period of sympathetic stimulation of Stern is very probably identical with my first period of increased permeability, and her second period of sympathetic depression identical with my second period of decreased permeability. Should this assumption be correct, our two ways of therapeutic approach would prove to be complementary: the sympathetic block would be indicated during the first period, so as to prevent plasmorrhoea through the capillaries and thus the development of the second phase. Should the second phase develop in spite of the sympathetic block, or should the patient come under treatment at this late stage, an intrathecal injection of potassium phosphate may be indicated, provided that further observations should confirm Stern's report.

Another explanation for the apparent discrepancy between Stern's results and mine might be the interesting fact described in earlier papers of Stern, that there is an "antagonism between the central and peripheral parts of the central nervous system as regards their reaction to the same substance." It is therefore possible that a central, intraventricular stimulation of the

sympathetic is equivalent in its physiological effect to a peripheral inhibition. Further experiments will be required to solve this question.

Conclusion

This short review of the literature and my own experiments should suffice to indicate the significance of the sympathetic nervous system in shock. It is the purpose of this article to lay down principles which, if put into practice, may prove to be of value. It is not advocated that other methods which have proved, so far, to be indispensable (blood transfusion, etc.) should be neglected. The combination of both should be tried in suitable cases. They are certainly harmless, and may be of great advantage to the patient. Only clinical experience will enable us to accept or reject these recommendations.

REFERENCES

Cannon, W. B. (1923). *Traumatic Shock*, Appleton and Co., New York.
Engel, D. (1941). *J. Physiol.*, **99**, 161.
—— and Forrai, E. (1943). Ibid., **102**, 127.
—— (1943). Ibid., **102**, 281.
Freedman, A. M., and Kabat, H. (1940). *Amer. J. Physiol.*, **130**, 620.
Freeman, N. E. (1932). Ibid., **103**, 185.
—— Shaw, J. L., and Snyder, J. C. (1936). *J. clin. Invest.*, **15**, 651.
Harkins, H. N. (1941). *Surgery*, **9**, 231, 447, 607.
Philipowicz, J. (1942). *Zbl. Chir.*, **69**, 1369.
Slome, D., and O'Shaughnessy, L. (1938). *Brit. J. Surg.*, **25**, 900.
Stern, L. C. (1942). *British Medical Journal*, **2**, 538.

Medical Memoranda

Suppurative Pylephlebitis

This case is reported for its clinical rather than its pathological interest.

CASE HISTORY

A woman aged 60 was admitted after the gradual onset of vague lumbar pain and nausea. She had no urinary or bowel symptoms, no shoulder pain or vomiting. She was obese and had always had a diffuse brown pigmentation, especially on the arms and legs. Her temperature was 99° and pulse 70. Her abdomen was soft, nowhere tender, and her liver was only just palpable. Within a few hours she lost both pain and nausea, but the next morning had a rigor. From then on she had a total of 31 rigors at intervals of 1 to 12 days. The temperature with a rigor varied from 100.4° to 105°; between rigors it swung between 97° and 101°. There was no rhythm or regularity either in the frequency of the rigors or in the daily temperature variation.

Apart from the rigors she had no other symptoms or signs. In fact, at the seventh week, after her longest interval free from rigors, she seemed so well that she was sent home; but she soon had another rigor and came back. After ten weeks she had a slight pain low in the left posterior axillary line, and we heard a pleural rub. This was replaced by a patch of dullness to percussion; but paracentesis yielded nothing and we thought that the dullness gradually disappeared. There followed another long period in which she felt perfectly well and ate heartily; this was the perplexing part of the picture. Then one evening in her eighteenth week she had a sudden attack of violent coughing, produced some foul green-brown muco-pus, became rapidly very ill, and died.

Investigations.—Blood:—1st week: Hb, 83%; leucocytes, 17,000—polys 83%, lymphs 13%, monos 3%; plasma chloride, 608 mg. per 100 c.cm.; culture sterile; agglutination negative for typhoid, Salmonella, dysentery groups, and abortus. 2nd week: Culture—no pathogen. 4th week: Hb, 85%; leucocytes, 12,000—polys 74%, lymphs 22%, monos 3%; culture sterile; agglutination negative for typhoid group and abortus; staphylococcal antileucocidin index, 0.16 K (upper limit of normal). 6th week: Leucocytes, 18,000. 9th week: Leucocytes, 54,000—polys 93%, lymphs 4%, monos 3%; culture sterile; W.R. negative; Kahn negative; urea, 70 mg./100 c.cm. Urine:—1st week: N.A.D.; diastatic index 5. 2nd week: N.A.D. Faeces:—1st week: Culture—no pathogen. 9th week: Culture—no pathogen. Sputum:—3rd week: Atypical haemolytic streptococci. 18th week: Offensive green-brown fluid; mixed bacteria, mostly *Staph. aureus*. *X*-ray:—Gall-bladder: No opaque calculi. Graham's test suggestive of pathological change. Chest: 2nd week—N.A.D.; 6th week—N.A.D.; 11th week—left basal pleural effusion; left diaphragmatic outline not seen; right diaphragm normal.

Post-mortem Examination.—Pus in lower half of left pleural cavity, loculated by light adhesions, communicating at one place, through lung, with bronchi. Multiple small abscesses in liver; pus in terminal section of portal vein. Microscopy showed suppurative pylephlebitis, with pus in portal veins, in many systems replacing wall and tissue round veins. All other organs, including appendix, healthy, except the gall-bladder, which was fibrosed and contained stones. We could not say how infection reached the left pleura—probably directly through lymphatic channels; but it is curious that the right side was unaffected. No local track was detectable. It seemed unlikely to be blood-borne, for it was the sole distant focus.

COMMENT

A case of irregular pyrexia with frequent rigors and a mild leucocytosis throughout. The pigmentation reminded us of Addison's disease, but this was quickly dismissed. Typhoid, abortus, and glandular fevers were not seriously considered because of the leucocytic activity; the first two were, in any case, eliminated by agglutination. A kidney abscess was eliminated, so far as was possible, by investigations. Eventually there remained the possibility of a chronic septicaemia. Three blood cultures were sterile; this, however, did not rule out a portal pyaemia. Mr. Henry Thompson was consulted, and the possibility of this and of a Charcot's biliary fever was discussed. Then, when pus burst into the left bronchi, we thought we might have missed a latent pulmonary or subphrenic abscess. Yet we were not greatly surprised at necropsy to find pylephlebitis: this insidious disease, whose nature remains cryptic for so long, could at the best have only been guessed at, and was.

Unusual features of this case were the large number of rigors; the fact that, throughout, these were the sole clinical manifestation (the only localizing signs were those of the pleural complication); the uncommon primary focus; and the unique termination.

I wish to thank Dr. Julius Burnford for his help and for permission to publish this.

P. MACDONALD TOW, M.R.C.S., L.R.C.P.

Broad Ligament Cyst in a Strangulated Hernia

Past records have shown that an inguinal hernia may contain a variety of different organs, both normal and pathological, but I think that this case is unusual enough to merit publication.

CASE RECORD

The patient, a widow aged 43, was first seen on May 5, 1944. She said that she had had a hernia for twelve months, but this had always been reducible and symptomless. At 5 p.m. on that day, while chopping wood, she had a sudden severe abdominal pain and repeated vomiting, and the hernia became irreducible. On admission her temperature was 101.2° and pulse 112, and she had a right irreducible inguinal hernia, but a cough impulse was present. A cystic abdominal tumour was noticed, arising from the pelvis and extending about two inches above the umbilicus. There were no signs of pregnancy, and her periods were normal. The passage of a catheter did not reduce the swelling. The patient stated that this swelling appeared to fluctuate in size from time to time.

At 10 p.m. operation was performed, and a sac of an inguinal hernia was dissected out. On opening the sac a fibrous mass the size of a pigeon's egg was delivered, attached to a cystic swelling which was not bowel or bladder. This in turn was opened, and a large quantity of clear yellow fluid escaped: five pints of fluid were aspirated, and the abdominal swelling dramatically diminished. The cyst was closed by a purse-string suture, and the fibrous mass, presumed to be necrotic ovary, was sent for section. (On microscopy, this later proved to consist of lymphoid tissue, with numerous foreign-body giant cells and granulation tissue, but no evidence of ovarian tissue.) The patient's condition did not justify laparotomy at this stage, so the hernia was repaired in the usual way.

On May 8 the temperature rose to 103° and thereafter was swinging; there was also some inflammation of the wound. Sulphathiazole (23 g.) was given. On May 14 she developed diarrhoea, which was presumed to be due to infection of the cyst.

On May 16 laparotomy was performed through a right paramedian incision. Intestines were packed off, and a large cyst was partly delivered into the wound, a purse-string suture was applied, and a French's needle was inserted. Four pints of thick pus were aspirated. The hole in the cyst was then closed. The cyst was then dissected out with difficulty owing to dense adhesions, and was found to be retroperitoneal, and to extend from the loin to the pelvis. The upper pole was in relation to the kidney, but not adherent to it. The lower pole was within the right broad ligament. The uterus and both Fallopian tubes and ovaries were normal. The cyst was removed and a drainage-tube was inserted through a stab wound in the loin, and another through the lower end of the incision draining the pouch of Douglas. During the operation one pint of blood was given intravenously, and, on account of the possibility of general peritonitis and paralytic ileus, intravenous glucose-saline was given post-operatively for 48 hours, and fluids by mouth restricted to sips. Sulphathiazole (27 g.) was given prophylactically. The tube in the loin was removed after 48 hours, and that draining the pouch of Douglas on the fourth day. Slight pyrexia persisted for 18 days, but the patient made an uninterrupted recovery.

COMMENT

It was concluded that this was a cyst of the broad ligament, a lobule of which had become strangulated in the inguinal hernia. Section of the cyst wall showed it to be composed of acute inflammatory tissue, lymphoid and fibrous tissue; the epithelial lining had been destroyed by the acute inflammatory changes.

My thanks are due to Dr. C. H. Laver for his permission to record this case, and for his helpful criticism of the account.

KATHLEEN N. BERGER, M.B., B.S.,
House-surgeon, East Surrey Hospital.
Redhill.

Reviews

MEDICAL SERVICES IN EIRE

The State of Medicine in Ireland. By W. R. F. Collis, M.D., F.R.C.P., F.R.C.P.I., D.P.H. Carmichael Prize Essay. (Pp. 70. 2s. 6d.) Dublin: The Parkside Press, Ltd. 1943.

Prize essays are often of academic interest only and soon forgotten, but this one deserves a happier fate. It calls for the serious attention of the Government and medical profession of Eire. It is a restrained but severe criticism of the lay-out of the services of that country. Dr. Collis sadly confesses that the medical reforms which were hoped for when Eire became a sovereign State have not materialized. In his preface the author emphasizes two premisses upon which the work is built. The first is that a point has been reached in the general conception of health policy which insists on a new stocktaking. He deals with the present situation in Great Britain, and says, "If medicine in England needs reorganization, medicine in Ireland needs it more." And this is amply borne out by his facts. Secondly, there is an "atmosphere of mutual distrust between the profession and the Department of Local Government and Public Health which, if allowed to develop further, will gravely compromise the health of the people of Eire." We think that this also is fully substantiated.

National Health Insurance in Eire provides no medical benefit. The insured population has to depend on the Dispensary system, which is still on "the pauper basis." The faults of this system have been exposed over and over again, and never more trenchantly than by Surg.-Gen. Evatt, who, as a special commissioner of the *B.M.J.*, visited Ireland in 1902. "Any treatment an insured sick person obtains is on the pauper basis through the dispensary doctor or by charity in a voluntary hospital. The idea that this is degrading to the honest citizen . . . has not yet penetrated the mass mind of society here."

Dublin has more small general and special hospitals than any other city of its size, with the inevitable out-patient abuse. There are State county hospitals which, in essence, are workhouse hospitals, though separated from the workhouse itself. The staffing of many has been improved. The windfall that the voluntary hospitals got from the Hospital Sweepstakes has been a doubtful advantage from the national point of view, because it gave an excuse for delay in dealing with the national problem. Dr. Collis describes the struggle among the hospitals for the millions of pounds which accumulated, and of which a large amount still remains undistributed. A Hospital Commission was appointed, but, its function being only advisory, the onus of implementing its recommendations was on the Ministry, whose attitude is apparently still governed by the Poor Law conception. Recommendations in favour of setting aside a large sum for the greatly neglected subject of research were ignored. The sweepstakes came to an end with the outbreak of war without any attempt to tackle national medical reconstruction. Dr. Collis believes that the profession has lost faith in the power or the will of the Department to plan a real medical service for the country, and says it "has no interest in preventive or social medicine."

Proposals are made for the future, and he hopes that the profession will itself put up a plan for co-ordination of the medical services, though he is very doubtful whether, without a considerable stirring of public opinion, the Department will take any action. He suggests a National Board of Health, with the Minister of Health and Social Welfare as president, having representatives of every kind of practitioner, assisted by whole-time advisers. The Minister could tell the Board how far its proposals were likely to be supported by himself and implemented by the Dail. The author is particularly severe on the lack of antituberculosis measures, to which he would give priority in any scheme for an improved medical service. He points out that the death rate for tuberculosis has declined in most other countries, "whereas Eire has actually allowed the disease to gain on us."

We cordially recommend this essay to the attention of our colleagues in Eire and to the Department whose obvious duty it is to try to remedy the state of things shown in its pages.

A. C.

MENTAL HEALTH AND THE WAR

The War and Mental Health in England. By James M. Mackintosh, M.D. (Pp. 91.) New York: The Commonwealth Fund: London: Oxford University Press. 1944.

This small book, comprising lectures by Prof. James Mackintosh for American audiences, is so full of material that a summary cannot do more than hint at the principal points of practical interest, especially those connected with preparing for the peace which we all hope may not be far distant.

The earlier part of the book is principally of historical interest, and is devoted to a masterly summary of the many problems of adaptation that beset different sections of the community—for example, the new soldier, the industrial worker, the housewife, the child, the aged, the hospital patient, and the student. While emphasizing how magnificently people have stood up to their ordeals, he asks whether many of the painful experiences may not have left their effects which may one day appear on the surface. Certainly we must expect that much chronic illness in the future will be attributed to the war. The separation of children from their parents for long periods, for example, is expected to be a major source of problems later; not only on the return to the home, but in more subtle ways afterwards.

The need to have an organization ready to take care of the manifold problems of resettlement is one that should be recognized officially in a comprehensive way. The Tomlinson report left something to be desired in this respect. It recognized the existence of neuroses and psychoses, but not of the mental aspect of ailments diagnosed as physical—a much more extensive problem. It contemplated also the readjustment of the patient in industry; but the problem is a human one of much wider scope than that.

It is clear that much education, not only of the public but of official bodies, is still required. It is to the Provisional National Council for Mental Health that Prof. Mackintosh looks to "make the mental health movement in England to learn to stand on its own feet" as an organization supported by the people. He feels that whole-time salaried officials are essential for bringing this about. Voluntary workers alone cannot do it—for want of time, and very often from lack of technique. To meet the greatly increased demand for trained workers that is bound to result from a social security programme Prof. Mackintosh has in view a common two-year training, with a third year for those who wish to specialize in medical social work, psychiatric social work, industrial welfare, etc.

These are samples of the activities that he sees as part of a systematic education of the community in mental health; but he does not forget that a national ideal of some sort is necessary too. He does not, however, attempt to prescribe what the nature of the national ideal shall be beyond a capacity for enjoying work and making good use of leisure.

REGIONAL ANALGESIA

Regional Analgesia. By H. W. L. Molesworth, F.R.C.S. (Pp. 90: illustrated. 8s. 6d.) London: H. K. Lewis and Co. 1944.

The need for a new book on the subject of regional analgesia might appear doubtful, seeing that there are already several very capable treatises to be obtained, but Mr. Molesworth's has at least the merit of concentrating the main principles into some ninety pages, and, as stated in the preface, it represents personal experiences, which are always of value to the reader. It seems that interest in local, regional, and spinal analgesia is increasing in this country; there can be no doubt that in many circumstances there is much to be gained by the employment of one or other of these methods.

In this book there is nothing novel in the methods described, but the matter is presented in a succinct way which avoids all ambiguity. After a consideration of general principles and of certain details of technique, the various applications of regional analgesia are dealt with, as is appropriate, on a regional basis. It is to be noted that the author's preference is for the well-tried novocain and percaine solutions in suitable strengths. The use of the older term "novocain" in place of the official "procaine" throughout the book is a wise precaution against any tendency to muddle "procaine" and "percaine," especially as the text does not refer to the latter substance under its newer designation "nupercaine."

The final chapter gives a very brief summary of the methods of spinal analgesia in common use. There are numerous illustrations—clear line drawings for the most part—showing the distribution of the nerves and the exact points at which the injections are made. The book will be a useful and handy guide to those who propose to employ regional analgesia more extensively in their practice and who need a short introduction to the subject.

Notes on Books

Modern Treatment Year Book, 1944, is the tenth in the series of collected papers written for the *Medical Press and Circular* under the editorship of Surg. Rear-Adml. CECIL P. G. WAKELEY and republished by Baillière, Tindall and Cox at 16s. As in recent years, the contents are grouped into those on miscellaneous topics and those on war medicine and surgery—twenty-one of each. There is no unifying thread, but almost every article is mainly concerned with treatment, and some of them have bibliographies.

Casualty Work for Advanced First-Aid Students, by A. W. MACQUARRIE, M.B., Ch.B., is published by E. and S. Livingstone at 4s. 6d. Still the making of these books has no end, but the end of the war is in sight. Still road accidents abound, and the facts within the covers of this pocket-book are needful for street and other first-aid work. The volume contains but little new, and some of its old is very antiquated. "Fractures have been," and still are, "classified" as simple, compound, etc., so it is not so "simple" as it appears. Here "open" and "closed" are used for wounds, but not for fractures. It is perhaps questionable to state that "any injury is a wound." Fifty-five pages on transport, out of 223 pages in all, might be thought to be a high proportion in a manual of this type. As a "refresher" book and one readily carried in the pocket, this recent production may even now be of use.

Preparations and Appliances

APPARATUS FOR CONTINUOUS INTRAVENOUS ANAESTHESIA

Major WALLACE M. DENNISON, F.R.C.S.Ed., R.A.M.C., writes:

Continuous drip anaesthesia is becoming increasingly popular and has already proved its value in battle surgery. Many types of apparatus have been described, but essential parts of most of them are not available in Service hospitals. After many experiments the following apparatus was assembled from parts available in all military hospitals. It is at present in use in our hospital, and in the hands of Capt. W. G. Taaffe, R.A.M.C., has proved to be foolproof.

A three-legged douche-stand on wheels forms a secure and mobile base for the apparatus (Fig. 1). To one of the four

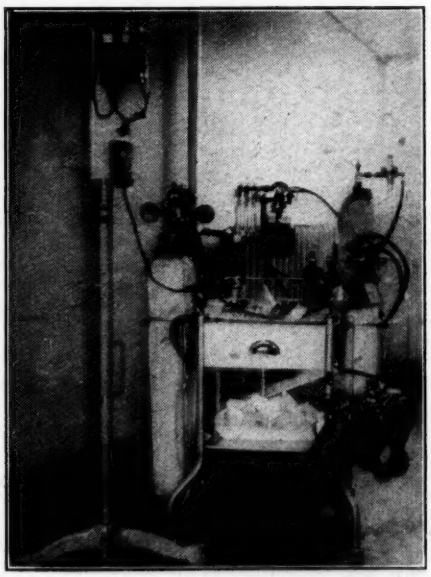


FIG. 1

uprights a wooden panel is clamped. This panel carries the saline and pentothal containers, fine-adjustment screws, and a double-drip bulb. The saline container is the standard 500-c.cm glucose-saline-giving bottle, held in position by a shoulder collar and a strong spring clip (Fig. 2). The anaesthetic solution is carried in the barrel of a 20-c.cm. syringe fitted with a rubber stopper perforated to carry a glass tube with filter wool. The double drip is formed from the filter from a Horrocks infusion

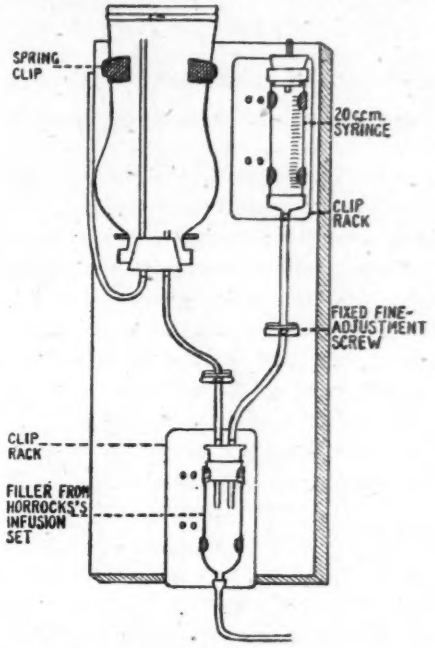


FIG. 2

set, the doubly perforated flanged bung from a transfusion set, and two short pieces of glass tubing drawn to a fine point. The anaesthetic container and the drip bulb are held in position by the clips on the clip rack from a 20-c.cm. Record syringe case. Both clip racks are permanently fixed to the base-board. Fine-bore rubber tubing is used throughout, and the needle (Wassermann size) is attached to a glass vein-seeker.

After filling the pentothal container (using either its own plunger or one from another syringe) it can be temporarily laid aside, if desired, by affixing the sealed hub of a hypodermic needle to prevent the contents running out. It is the practice here to add 1 c.cm. of nikethamide (coramine) to 20 c.cm. of pentothal solution. Before inserting the needle both fine-adjustment screws are tested and all air is expelled from the tubing. The arm is splinted in the usual fashion and a sphygmomanometer cuff is employed to render the veins prominent. The saline flows continuously at 40 to 60 drops a minute, and the anaesthetist need only give a light touch with two fingers to turn off the pentothal. The intravenous anaesthesia is combined with light gas-and-oxygen when required. Incidentally, the anaesthetic is never started until the oxygen is *in* the theatre and turned on.

The holes in the fine-adjustment screws were countersunk and the apparatus rapidly assembled by Pte. Chanter, R.A.M.C., operating-room assistant.

A HISTAMINE-PROTEIN COMPLEX

Messrs. Parke, Davis and Co. have prepared a histamine–protein complex, "lertigon," which is intended for use in the treatment of allergic conditions. The assumption underlying lertigon is that allergic manifestations are due to the release of histamine when the reaction between some antigen and its antibody takes place within the cells of the tissues and not in the extracellular spaces or in the blood stream. Lertigon is a histamine–protein complex which, when injected, produces antibodies which not only neutralize the histamine–protein complex, but, it is hoped, also neutralize the histamine, following Landsteiner's work. The protein which is used to unite with histamine is horse serum globulin, treated, presumably with alkali, to remove its antigenic properties. It is thus said to be "despeciated." It is then combined with histamine as an azoprotein combination. Clinical results are said to show that the injected complex produces in patients a precipitin so that the patient's serum neutralizes histamine *in vitro*. In the patients themselves there is said to be a reduction in the threshold for a skin test with histamine; presumably a larger dose is needed to produce the usual capillary dilatation and wheal formation.

Lertigon is recommended for the treatment of allergic forms of bronchial asthma, vasomotor rhinitis, eczema, urticaria, and contact dermatitis, in which either the allergen is not discoverable or complete avoidance of the allergen cannot be obtained. It is given by intradermal injection in doses of 0.01 to 1.02 c.cm.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY SEPTEMBER 30 1944

HYPOGLYCAEMIA

It is still common to regard hypoglycaemia as a dramatic condition due either to a tumour of the islet cells of the pancreas or to some other obscure endocrine condition or to overdosage with insulin. The first cause is certainly, as Lawrence[1] pointed out in a recent letter to this *Journal*, of considerable rarity and the last unlikely to be missed; and it may well be that spontaneous hypoglycaemia has recently been cited too often as the explanation of obscure symptoms. Hypoglycaemia should be diagnosed only when the symptoms are associated with a blood-sugar level low for the individual in question; when they can be reproduced by a reduction of the blood sugar to this level by fasting, exercise, or the injection of insulin; and when they can be relieved by the raising of the blood sugar by means of glucose. Even when these criteria are borne in mind, opinion is gaining ground that many cardiac and neurological symptoms may be due to a blood sugar which, though not necessarily below the limits of the usual, has fallen too rapidly or to a level uncomfortably low for the individual concerned. The level of blood sugar at which symptoms may occur varies from one individual to another. Hill, Sargant, and Heppenstall[2] have stated that people with cerebral dysrhythmia are particularly susceptible to lowering of the blood sugar and may have symptoms at what are usually regarded as normal levels. They described[3] one patient in whom abnormal behaviour developed together with an unstable electro-encephalogram when the blood sugar sank to 100 mg. per 100 c.cm.: in one such incident he murdered his mother. A patient described by Romano and Coon,[4] whose behaviour was usually correct, suffered from episodes of uninhibited emotional behaviour due to an islet cell tumour and was cured by its removal. Parfitt,[5] in reviewing the neurological and psychological effects of hypoglycaemia, quotes references to manic, confusional, paranoid, catatonic, and hallucinatory states, hysteria, automatism, amnesia, stupor, depression, and narcolepsy. Happily most of us just feel tired.

Cardiac symptoms in hypoglycaemia have been described by several authors in recent years. In 1931 Waters[6] described a patient whose paroxysms of tachycardia were associated with a low blood sugar, and two years later Sippe and Bostock[7] pointed out that angina might be precipitated by hypoglycaemia. In 1935 Harris[8] described the concurrence of hypoglycaemia with tachycardia, palpitations, extrasystoles, a sense of suffocation, and precordial pain. Messenger[9] in 1938 observed various signs of overacting heart in patients receiving insulin shock treatment for mental disorder. Recently Harrison, Finks, and Winston-Salem[10] in America and Raymond Greene[11] in this country have independently drawn attention to the similarity in symptoms between some cases of hypoglycaemia and some cases of effort syndrome. Harrison and his colleagues described 31 patients who suffered from symptoms identical with those of effort syndrome two or more hours after meals. Their trouble was reproducible by injections of insulin and relieved by sugar. They confirmed the important observation of previous workers that the usual glucose-tolerance test is almost valueless in diagnosis. Only 3 of their 31 patients had low fasting blood-sugar levels, and two of them had lag storage curves. The test had to be carried on for 2 to 4 hours to disclose the low sugar value in many patients. Even so the values were sometimes low only for the individual patient and not in comparison with the normal. Some patients have symptoms of hypoglycaemia at a level of 70 mg. per 100 c.cm., whereas others fail to have symptoms at much lower values. The body appears to accustom itself to such low levels, and patients with Simmonds's disease, Addison's disease, anorexia nervosa, and idiopathic steatorrhoea often remain comfortable at levels at which diabetics would go into hypoglycaemic coma. Of the 31 patients described by Harrison and his colleagues, 14 had previously been said to be suffering from "cardiac neurosis." Of Greene's 5 patients all had been labelled "effort syndrome." That the label may fit is suggested by the fact that 7 of Harrison's 14 and 2 of Greene's 5 continued to be neurotic individuals after their cardiac symptoms had been relieved. Greene points out that the similarity of symptoms is only to be expected. The symptoms of effort syndrome are the somatic accompaniments of fear, and are due to excessive secretion by the adrenal medulla. In hypoglycaemia the early symptoms are due to the same cause, evoked not by fear but by a natural physiological reaction designed to increase the mobilization of liver glycogen. The hypoglycaemia of these patients may itself be due to psychological conditions, but whether or not this is so it can be relieved by dietetic treatment.

This treatment for many years consisted of a high intake or carbohydrate, and it is true that symptoms of hypoglycaemia may be relieved by eating sugar. In 1943 Thorn, Quinby, and Clinton[12] published a comparison of the metabolic effects of isocaloric meals of varying composition. The results supported Conn's[13] opinion, which had long been gaining ground, that better results would be obtained by a high-protein diet. A high-carbohydrate breakfast of 400 calories (containing only small quantities of fat and protein) results in an immediate rise in the blood sugar, followed an hour or so later by a fall, which, two to three hours after breakfast, reaches a level well below the fasting value. There is then a gradual climb to fasting levels which are not reached till some five hours after breakfast. A high-fat breakfast (containing only small quantities of

1 *British Medical Journal*, 1943, **2**, 760.
2 Ibid., 1944, **1**, 162.
3 *Lancet*, 1943, **1**, 526.
4 *Psychosomat. Med.*, 1942, **8**, 283.
5 *Proc. roy. Soc. Med.*, 1937, **31**, 137.
6 *Southern med. J.*, 1931, **24**, 249.
7 *Med. J. Austral.*, 1933, **1**, 207.
8 *Southern med. J.*, 1935, **28**, 959.
9 *Ann. intern. Med.*, 1938, **12**, 853.
10 *Amer. Heart J.*, 1943, **26**, 147.
11 *Lancet*, 1944, **2**, 307.
12 *Ann. intern. Med.*, 1943, **18**, 913.
13 *J. Amer. med. Ass.*, 1940, **115**, 1669.

carbohydrate and protein) likewise produces an immediate rise in the blood sugar, followed by a more gradual fall to a trough at five hours, just when the carbohydrate has risen again to fasting levels. On the other hand, a high-protein breakfast (containing only small quantities of carbohydrates and fat) gradually raises the blood sugar, which reaches its maximum after only two hours and thereafter remains almost level for another three. The value of a "good mixed diet" is beautifully shown. The blood sugar at first rises rapidly by reason of the carbohydrate and fat. The level is maintained by the protein. As the old wives say, "Bread-and-butter doesn't stay by you; it's the cut off the joint which does that, not the two veg." Those of us who find ourselves unduly tired as remembrance of the last meal grows dim may comfort ourselves. We haven't got tumours of the pancreas, and we shall be all right again when we can throw that roll at the waiter's head and order a tournedos Rossini.

INFANTILE GASTRO-ENTERITIS

"Infective enteritis or diarrhoea" among children under 2 years of age, with a death roll of 2,000 to 3,000 every year, ranks second to pneumonia as a killing infection in infancy. The majority of deaths occur in the first year of life, and are to be attributed mostly to the diarrhoea and vomiting of dubious and possibly diverse aetiology which masquerades under a variety of names from summer diarrhoea to cholera infantum. In this country dysentery and salmonella infections are rare, and rarely fatal, in the first year of life The incidence of non-specific enteritis, on the other hand, is difficult to gauge because it is not generally notifiable, but the extent of the problem may be guessed from data from L.C.C. hospitals in pre-war years. Thus in 1936 1,692 children (under 2) with enteritis were treated in these hospitals and 535 died; in 1937 the corresponding figures were 1,759 cases with 438 deaths.[1] It has long been recognized that gastro-enteritis is predominantly a disease of artificially fed infants living in urban poor-class districts, and Gairdner[2] has lately made an interesting analysis of its ravages in town and country communities. Thus for the years 1935–8 the diarrhoeal mortality rate was 5.6 and the infant mortality 56.4 for England and Wales, 2.4 and 49.6 for rural districts, 5.9 and 63.3 for county boroughs, and 12.1 and 60.3 for metropolitan London. This high diarrhoeal mortality in the London area did not affect infants in the first month of life as it did in the industrial North, but in the succeeding months of the first year infective enteritis was the chief cause of deaths among infants in Greater London. Comparisons with other cities showed that for the same period (1935–8) Birmingham had a diarrhoeal mortality of 6.9, Manchester 5.8, and only Newcastle, with an excessive infant mortality of 83, had a higher diarrhoeal death rate (13.8) than metropolitan London. Statistical analysis also showed that, until 1929, London shared in the general downward trend of diarrhoeal mortality, whereas in the ten years since then the rate for London has been rising, while those for the county boroughs have continued to fall. An explanation of this disturbing feature is hard to find. Differences in ascertainment and certification may be partly responsible, but an important contributory factor may be a greater tendency in the London area to send young children into hospital. (The figures relate to pre-war years, so that wartime nurseries are not involved.) It is now generally agreed that children under 1 year of age should not be admitted to hospital for minor ailments unless they can be nursed in isolation; yet many infants with mild dyspepsias are notified as cases of infective enteritis and cannot be refused admission to municipal hospitals. Owing to shortage of isolation accommodation a fair proportion of these infants have to be nursed in open wards by the barrier or bed-isolation technique, which is not effective enough to prevent re-infection and relapses. Thus in the careful study reported by Drs. Alexander and Eiser in our present issue the relapse rate was 31% among 67 infants nursed in the barrier ward and only 8% among 73 babies nursed in cell wards. When it is added that 6 of the 8 deaths in their series followed a relapse, the importance of proper isolation for babies admitted to hospital becomes obvious. With the isolation technique evolved by Gladys Dick for the Cradle at Evanstown no instance of cross-infection with enteritis occurred among 1,650 homeless babies nursed for an aggregate of 66,000 days.[3] By contrast the diarrhoeal death rate among London's illegitimate infants is so high that such an infant has a 1 in 40 chance of dying of this disease before reaching its first birthday.

Apart from isolation, the care and treatment which the infant with diarrhoea and vomiting receives may play a major part in the outcome. Case mortalities in hospital have varied from 30 to 60%, and where a division is made into the severe dehydrated cases and mild infections the fatality rate in the former group has rarely been less than 50%.[4] A case mortality of 11.6% among 69 dehydrated infants in Drs. Alexander and Eiser's series of 140 cases is therefore an achievement which must attract attention. Their plan of campaign was to search for and treat any forms of parenteral infection, to correct fluid loss by intravenous Hartmann's solution supplemented by half-strength serum or plasma, to return as quickly as possible to a diet sufficient to satisfy the patient's requirements, and to combat shock in collapsed and dehydrated infants. Secondary anaemia, a common feature, was corrected by iron and whole-blood transfusions. This regime may not seem very different from the treatment advocated by other workers, except perhaps in the early and more frequent use of plasma or serum. Probably what matters most is the intelligence, skill, and enthusiasm with which treatment is applied, and the results obtained in this series reflect credit on both the medical and nursing staffs who carried it out.

Drs. Alexander and Eiser stress the aetiological role of parenteral, particularly upper respiratory, infection in gastro-enteritis, and obviously it may be an important factor both causally and as a secondary focus which aggravates the condition. However, many infants with diarrhoea and vomiting have no parenteral infection, and other infants with respiratory disease do not develop diarrhoea

[1] Mitman, M., *Control of Common Fevers*, p. 262, London, 1943.
[2] *Proc. roy. Soc. Med.*, July, 1944, p. 480.
[3] Sauer, L. W., *J. Pediat.*, 1935, **6**, 753.
[4] Campbell, R. M., and Cunningham, A. A., *Arch. Dis. Childh.*, 1941, **16**, 211.

and vomiting. A causal virus, gaining entry by the oropharynx like the virus of poliomyelitis and spread from both the respiratory and alimentary tracts, could be postulated to explain these anomalies. Meanwhile controlled tests might be made of the newer sulphonamides (e.g., succinyl sulphathiazole) for the treatment of intestinal symptoms. Liver damage is often an outstanding feature in fatal cases, suggesting either absorption of toxic substances from the gut or a deficiency in some essential amino acid. This aspect of the problem deserves study, and the use of protein hydrolysates either orally or intravenously seems worth a trial in gastro-enteritis. But in this as in other infections prevention is better than cure, and there is urgent need for a publicity campaign to persuade both doctors and the public that breast-feeding for 6 months is the best antidote for this serious drain on infant life.[5]

CHOLINESTERASE AND MYASTHENIA GRAVIS

The search for an explanation of the mechanism responsible for the causation of myasthenia gravis has been greatly stimulated in recent years by the development of knowledge of neuro-muscular transmission processes. Theoretically, myasthenia gravis might be due to inadequate release of transmitter substance at the neuro-muscular junction; to an unduly high threshold of excitability of the motor end-plate to the chemical transmitter; or to an excessively rapid destruction of the transmitter substance. Acetylcholine appears to be the chemical transmitter at the neuro-muscular junction. The existence of an enzyme capable of hydrolysing acetylcholine and acetic acid was established by Loewi and Navratil[6] in 1926. Recently Mendel and Rudney[7] have shown that the "cholinesterase" present in blood serum and certain tissues is a non-specific enzyme capable of hydrolysing not only choline esters but non-choline esters as well. Apart from this "pseudo-cholinesterase" a specific cholinesterase hydrolysing exclusively choline esters was demonstrated in brain tissue and the red blood corpuscles of some species. Mendel and Rudney concluded that measurements of cholinesterase activity in which acetylcholine is used as substrate give an inaccurate picture of "true" and "pseudo" cholinesterase in any mixture of the two enzymes. It is probable that some controversy in the literature with regard to cholinesterase levels in serum in certain pathological conditions might be resolved if this recent distinction between specific and non-specific acetylcholine-splitting enzymes were taken into consideration.

Various observers tried to find evidence for the conception of a faulty neuro-muscular chemical transmission in cases of myasthenia gravis in terms of a pathologically high cholinesterase concentration in the blood. However, this was not found to be the case, for low serum enzyme levels are claimed by Stedman and Russell,[8] and no significant differences from normal were found by Jones and Stadie[9]; most recently Wilson and Stoner[10] found the serum cholinesterase activity within normal range in 12 out of 14 patients suffering from myasthenia gravis, and 2 subjects showed low enzyme levels. With regard to the myasthenia gravis problem, serum enzyme estimations might not necessarily give a relevant picture of the situation, and it is perhaps somewhat surprising that, so far, only two reports have been published of enzyme determinations in myasthenic muscle itself (Jones and Stadie[9]; Goodman, Carlson, and Gilman.[11]) There was no evidence of any material increase in cholinesterase activity of myasthenic as compared with normal muscle, and at present there is no experimental support for the initial working hypothesis that the muscular weakness in myasthenic patients is due to an excessively rapid destruction of the chemical transmitter, acetylcholine, by high concentrations of cholinesterase at the neuro-muscular junction or in the blood. And myasthenic patients are not known to suffer from any derangement of autonomic functions which depend on cholinergic transmission of nerve impulses. On the whole, evidence suggests that the basic disturbance of the myasthenic is an elevation of the motor-end-plate threshold to the effects of motor-nerve impulses (Gammon, Harvey, and Masland[12]); this conception is supported by the recent work of Wilson and Stoner,[10] who demonstrated in the serum of myasthenic patients not under prostigmin treatment a substance, partially soluble in alcohol, which interfered with neuro-muscular transmission and produced a curare-like paralysis on the isolated nerve-muscle preparation of the frog.

The results of cholinesterase determination during exercise and during circulatory stasis are difficult to interpret. Stoner and Wilson[13] found no change in the serum enzyme activity during exercise under ischaemic conditions in normal and myasthenic subjects (without and with prostigmin treatment). However, Croft and Richter[14] observed a shift of the enzyme from the red cells into the serum during muscular exercise. The significance of these findings is not clear. Recent work has shown that definite changes in cholinesterase activity can be produced by certain hypnotics. Prolonged administration of phenobarbitone soluble or phenyl-methyl barbituric acid reduces the amount of cholinesterase in serum by approximately 22% of the average amount of enzyme present in untreated subjects (Schütz[15]); the serum enzyme concentration remained unaffected by administration of a single large dose of these drugs. These findings were confirmed in guinea-pigs (Schütz[16]), where, in addition, a diminution of the enzyme content was observed in skeletal muscle and in the spinal cord. It is possible that the low enzyme levels reported in epileptics by Stedman and Russell[8] and Tod and Jones[17] are due to the chronic use of barbiturates in this condition.

OPHTHALMOLOGY IN THE FIELD

The ophthalmic surgeon in the Forces has an exacting task. A civilian ophthalmologist is more a physician than a surgeon, and more of a judge than a physician. It may be no mere coincidence, therefore, that Major H. B. Stallard in two illuminating articles[18] on ophthalmic war surgery can record that in four years of service he acted on occasion as a general surgeon and as P.T. and games officer for sixteen months to the exclusion of any clinical work except for frequent "free from infestation" inspections of several hundred troops. That he should command a rifle company in defence of a hospital against possible attacks from parachutists, fifth columnists, and such-like is almost an anticlimax. And on top of this there is a record of solid ophthalmic work carried out under trying condi-

[5] See *British Medical Journal*, 1944, **1**, 155.
[6] *Pflügers Arch.*, 1926, **214**, 678.
[7] *Biochem. J.*, 1943, **37**, 59, 64, 473.
[8] Ibid., 1937, **31**, 1987.
[9] *Quart. J. exp. Physiol.*, 1939, **29**, 63.
[10] *Quart. J. Med.*, 1944, **13**, 1.
[11] *J. Pharmacol.*, 1939, **66**, 15.
[12] *Biol. Symposia*, 1941, **3**, 291.
[13] *J. Physiol.*, 1943, **102**, 1.
[14] Ibid., p. 155.
[15] Ibid., p. 259.
[16] Ibid., p. 269.
[17] *Quart. J. Med.*, 1937, **6**, 1.
[18] *Brit. J. Ophthalmol.*, 1944, **28**, 105, 261.

tions. A daily routine which begins, in military terminology, at 06.15 and ends at 22.30, and treatment of casualties produced by battle, accident, and stupidity caused by those "fools who despite warning orders allow their curiosity full reign in the inexpert dismantling of hand grenades, fuses, and mines, or in boisterous play throw hand grenades near each other," gave ample opportunity for a variety of experience. Stallard's articles show that experience under difficult conditions can add substantially to our knowledge. New plastic operations for the reconstruction of colobomata and much loss in the eyelids have been developed, and, what is of particular interest, a technique for the extraction of intraocular foreign bodies by the posterior route. Intraocular foreign bodies seen in the present war are generally feebly magnetic, and their removal is a technical problem of first magnitude. The general aspects of this problem were defined by Mr. L. H. Savin last year in a Hunterian Lecture at the Royal College of Surgeons, when he showed from human and experimental material that aluminium alloys, as these foreign bodies generally are, are far from innocuous to the eye, while their removal involves great difficulties in accurate location and new techniques. The work recorded by Stallard shows that the problem may not be so insuperable as is generally believed. The two outstanding ophthalmic difficulties the present war has brought out are the non-magnetic intraocular foreign body and the multiple injuries, including bilateral eye injuries, produced by land mines. The advent of the sulphonamides and of penicillin have, however, contributed largely to successful treatment. The perusal of the statistical data supplied by Stallard is far from depressing.

PAREGORIC

We remember that the only cough mixtures which were appreciated by the mothers in the out-patient department were those which contained paregoric, or tinct. camph. co. as it used to be called. It was paregoric which stopped the children from coughing all night. We did not doubt that its virtue lay in the tinct. opii it contained, and that rationalization would one day sweep it away. It is therefore interesting to discover that a pharmacologist has thought it worth while to measure its expectorant action and to compare it with that of its several constituents, and has been rewarded by finding that the expectorant effect of paregoric is greater than the sum of the effects of the constituents, and, above all, that like good wine it improves with age. It is the old paregoric, brown with some years of storage, which is the best. Eldon Boyd and Marion MacLachlan,[1] working at Kingston, Ontario, have delved into the history of paregoric. They conclude that it was the final form of many mixtures containing opium which go back as far as the Greeks, Romans, and Arabians. They are not prepared to regard paregoric as invented by Le Mort, who was professor of chemistry in Leyden from 1702 to 1718. He concocted a mixture containing honey, liquorice, flowers of Benjamin, opium, camphor, oil of aniseed, salt of tartar, and spirit of wine; this mixture became official under the name of Elixir Asthmaticum in the *London Pharmacopoeia* of 1721 and is commonly regarded as the original paregoric. But beside their historical research (which is only touched on here) Boyd and MacLachlan have used a method of measuring expectorant activity devised by Perry and Boyd[2] in 1941. They insert a tracheal cannula into the lightly anaesthetized animal and allow it to breathe warm moist air. Since the animal is tilted tail-upwards, the outflowing secretion from the respiratory passages can be collected and measured. Cats, rabbits, rats, guinea-pigs, and even hens can all be used, and the administration of paregoric by mouth causes an increased output of secretion, which is most striking in the rat—three- to four-fold—and is due to a reflex from the stomach, as it does not occur when the gastric nerves (branches of the vagus) are cut. Boyd and MacLachlan have found that tinct. opii, camphor, and alcohol all play a part in this expectorant effect, alcohol being particularly potent. Benzoic acid and oil of anise, on the other hand, have no effect. The authors have some evidence that paregoric itself has a more prolonged expectorant action than the sum of its component parts, which if true argues extremely keen powers of observation in those who first compounded it. Finally, they state that old paregoric is much better than fresh; they regard their experiments as clearly demonstrating this, and suggest paregoric should stand for at least two or three years.

[1] *Canad. med. Ass. J.*, 1944, **50**, 338.
[2] *J. Pharmacol. exp. Therap.*, 1941, **73**, 65.

CHEESE-BORNE OUTBREAK OF TYPHOID FEVER

In the *Journal* of June 12, 1943, we referred to an outbreak of typhoid fever in Manitoba traced to the consumption of immature cheddar cheese made from infected milk. Another outbreak, attributed to the same cause, has been described in Canada by Gauthier and Foley.[1] The cases occurred during September and the first week of October, 1941, among a group of adjacent villages in Champlain County, Quebec. Altogether 40 cases were notified, of which 6 proved fatal. Over 60% of the patients were in the age group 10–29 years, and the number of male patients was nearly double that of females. Such an age and sex distribution was suggestive more of an article of food as the vehicle of infection than of water or milk. Careful inquiry narrowed the source of infection down to a butter and cheese factory (R) in the neighbourhood. Since only 24 of the patients had eaten butter from this factory, suspicion became centred on the cheese. This was confirmed, partly by finding that every patient had partaken of the cheese, and partly by the occurrence of four cases (included in the 40) in a doctor's family in Montreal, to which cheese from the R factory had been brought back by the doctor himself after a visit to Champlain County. How did the cheese become infected? Investigation at the factory disclosed no history of typhoid fever among any of the employees, and repeated samples of faeces proved bacteriologically negative. The cheese itself had been made from raw milk and offered for sale within ten days of manufacture. The milk came from eighty farms, but on none of these did inquiry reveal the previous occurrence of typhoid fever, with the exception of one farm on which there was a known carrier, Mrs. C. A., who had received instructions about the limitations of her work. On another farm a child had had a mild fever in August, 1941, lasting for 2 to 3 days, and examination of his blood serum disclosed titres of 1/50, 1/75, and 1/25 for *Bact. typhosum* O, H, and Vi antigens respectively. He had never been inoculated against enteric fever, so that this result was highly suggestive of the carrier state. Eight specimens of his faeces, however, proved negative, and, rightly or wrongly, this boy was discounted as a probable source of infection. On the other hand, Mrs. C. A., the known typhoid carrier, admitted that she had disobeyed orders and had milked cows during the latter part of August. The milk had been sold to the R cheese factory. Cultures of the typhoid bacilli were isolated from each of the 40 patients.

[1] *Canad. publ. Hlth. J.*, 1943, **34**, 543.

None of the cultures could be typed locally by the bacteriophage method, but 30 of them were sent, together with the strain from Mrs. C. A., to Dr. Craigie, who found them all to be imperfect Vi forms belonging to Group D1. The conclusion was therefore drawn that the cheese had been made from raw milk infected with typhoid bacilli derived from the typhoid carrier, Mrs. C. A. Since the cheese had been offered for sale ten days after its manufacture, typhoid bacilli had not died out completely.

This story illustrates once again the danger of eating immature cheese. Before the war British practice was to allow cheddar cheese to ripen for 5 to 9 months at a temperature of about 50 to 60° F. There is reason to believe that this time was sufficient to allow all pathogenic organisms, including tubercle bacilli, to perish. During the war, however, the period of ripening has been shortened. In addition, a considerable quantity of cheese is imported from the United States which has never been properly ripened at all; instead it has been stored in a refrigerator, brought over here, and sold often within a few weeks of its arrival. It is very doubtful whether such cheese can be regarded as safe for human consumption. Indeed, recent observations by Campbell and Gibbard[2] show that cheddar cheese made from milk artificially infected with typhoid bacilli and stored at 40 to 42° F. may still be infected after ten months. From the public health point of view it would be advisable to insist that cheese made from raw milk should be ripened for at least three months at 50 to 60° F., and for at least 9 months at 40° F. Otherwise the milk should be pasteurized before being run into the cheese vat.

COLITIS AND X RAYS

In view of the sensitivity of the intestinal mucosa to penetrating radiation it is perhaps surprising that ulcerative colitis as a sequel to irradiation of the abdomen should have escaped recognition for so long. For in the last four years Engelbreth-Holm[3] has found, among 100 necropsies of carcinoma of the cervix in the Copenhagen Radium Centre, four in which death was due to ulcerative colitis developing after *x*-ray treatment. The lesions macroscopically and microscopically were identical with those seen in idiopathic ulcerative colitis, and since they involved the entire colon they could not be ascribed to overdosage or direct radiation injury; indeed, one case was given only palliative *x*-ray treatment with the relatively small tumour dose of 2,200 *r* in 36 days, and the other three had combined radium–*x*-ray therapy on standard lines. Diarrhoea and proctitis are often encountered towards the end of the radiotherapy course, but they are readily controlled by opium and usually subside within a week of stopping the irradiation. In the four cases reported here, however, the diarrhoea became purulent, the disease took a rapid course, and all four patients died after 9 to 30 days of illness. There was no "radiation ulcer" in the rectum, and no evidence of endarteritis in the microscopical picture[4]; and in any case the typical map-like ulcerations were as well marked in the transverse colon far away from the field irradiated as in the sigmoid loop. Engelbreth-Holm cites Chrom's observation that the intestinal mucosa, normally impermeable to the bacteria within the bowel, loses its efficiency as a barrier after *x*-irradiation, and suggests that the occurrence of extensive ulceration in only a few of the numerous patients submitted to a uniform treatment may be due to the presence of pyogenic bacteria in those cases. To explain the ulceration in parts of the colon not directly irradiated he turns to the work of Lium and Porter[5]: they demonstrated that mucus normally protects the mucous membrane from ulceration, that spasm of the musculature emptied the goblet cells, and that ulceration then resulted from the slightest trauma or even from continued muscular spasm alone; hence the maximum distribution of the ulcers in the rectum, where the musculature is strongest, and next along the taeniae coli. Holm's observations thus afford support for Lium's view that muscular spasm plays a decisive part in the aetiology of idiopathic ulcerative colitis, for rectal tenesmus is often present in radiation proctitis; irradiation of the explants of colon in Lium's experiments should afford further information of value. It seems probable that ulcerative colitis has been overlooked as a cause of morbidity and mortality after radiotherapy of abdominal and pelvic neoplasms, and that when diarrhoea and rectal tenesmus fail to respond to opium, to starch or olive-oil enemata, or to mineral oil by mouth, the "dry powder" treatment for which Soper[6] claims success might protect the denuded mucosa and enable healing to proceed.

[2] *Canad. publ. Hlth. J.*, 1944, **35**, 158.
[3] *Acta. med. scand.*, 1944, **116**, 308.
[4] *British Medical Journal*, 1943, **2**, 459.

HEALTH OF AMERICAN TROOPS IN THE PACIFIC

A little-publicized aspect of the work of the medical authorities of the United States War Department is the constant attention given to the health and sanitary conditions in the islands of the Pacific. Before the recent landing in Guam, for example, a complete survey had been undertaken by the Army Medical Department, and information on the water supply, sewage disposal, and especially on diseases common to the area, was available to every medical officer taking part. Health measures were, of course, in operation under the U.S. Navy before the Japanese captured the island in 1941, and there had been a great improvement in conditions generally during the Navy's forty years' administration. But the health of an army is constantly threatened in the climate and circumstances prevailing in the Pacific Islands, and in Guam the natives have been slow to adopt sanitary measures. The survey issues the obvious warning that all water, regardless of its sources, must be regarded as unsafe until proved otherwise; but of more interest, as reflecting continued occupation of the island, is the instruction to M.Os to take steps as soon as they land to control flies, which are responsible for the spread of "enteric disease, yaws, and diseases of the skin." Twenty-five per cent. of Guam natives have hookworm, and it is therefore recommended that camps should be some distance from places frequented by natives and that no native should be allowed to enter a camp area. Men are advised also to wear shoes about the camp to guard against hookworm infection, and, to lessen the risks of their contracting dysentery and diarrhoea, are forbidden to eat in native houses. The U.S. Office of War Information states that similar surveys have been prepared for other enemy regions where American troops are likely to go.

The Royal College of Physicians announces that Sir Edmund Spriggs will deliver the Harveian Oration on Wednesday, Oct. 18, in the clinical lecture theatre of the Royal Infirmary, Manchester, at 3.45 p.m. Subject: "The Harveian Method in Literature."

[5] *Arch. intern. Med.*, 1939, **63**, 201; *Amer. J. Pathol.*, 1939, **15**, 73.
[6] *Clinical Gastroenterology*, London, 1939, Henry Kimpton, p. 196.

THE MIDDAY SCHOOL MEAL

A STUDY OF ITS RELATION TO THE TOTAL WEEKLY DIETARY OF A GROUP OF SCHOOLBOYS

BY

R. P. COOK, M.B., D.Sc.

W. A. DAVIDSON, M.D., D.P.H.

D. M. KEAY, M.B., D.P.H.

AND

D. G. McINTOSH, M.B., D.P.H.

(From the Physiology Department, University College, Dundee, and the Public Health Department, Corporation of Dundee)

We are investigating the clinical and nutritional status of a group of boys at a trades school in Dundee. This school undertakes the training of pupils for the six building trades. The boys are drawn substantially from the artisan class, and accordingly represent a uniform cross-section of a portion of the working-class community. The average family income is £4 10s. weekly.

This paper, which forms part of a more extended study, is presented to show the contribution of the midday school meal to the total dietary. A short account of some of our findings was given to the Biochemical Society (Cook, Davidson, Keay, and McIntosh, 1944). The relevant data are as follows: (i) Number of subjects, 39 (out of 100 invited to participate); (ii) ages, 14–15 years; (iii) period of study, January to March, 1944. The interest and co-operation of the boys were very striking. The midday meal, which is provided on each of the five school-days (Monday to Friday), is prepared in a central kitchen and distributed to the trades and other corporation schools. A typical meal consists of soup, meat, or fish, with potatoes and greens, and a sweet, usually a milk pudding. Second helpings are allowed. One-third of a pint of milk is given to each boy daily with his midday meal.

Methods of Investigation

Dietary Intake.—Each boy was provided with a tabular sheet, on which he entered his food intake at each meal for one week. One of us personally instructed each pupil, who at the same time received an explanatory leaflet, to serve as an aid in the method of completing the form. The individual foodstuffs were divided into at least 20 categories, and the values of the constituents in each for one week were obtained by the use of: (*a*) the food-value calculator of Vitamins Ltd.; (*b*) food tables given by Davidson and Anderson (1940); (*c*) bread and potato analyses kindly supplied by the Ministry of Food through the courtesy of Sir Jack Drummond, F.R.S., and Dr. Magnus Pyke. The values obtained are for foodstuffs prepared for consumption. While the methods used are admittedly liable to inaccuracies, it is felt that, taking the results as a whole, reliable data have been obtained. That the dietary results are of the correct order is indicated by the fact that determinations of the total nitrogen in 24-hour samples of urine from the boys gave values of protein equivalent (N × 6.25) of 36 to 111 g. per day, mean 68.2 ± 15.4 (cf. dietary) protein intake, mean 76.6 ± 16.4, in the accompanying Table). The levels of vitamin A and of ascorbic acid in the plasma also bear a general relationship to the dietary intakes.

Presentation of Results.—These are shown in the Table. The range, mean, and standard deviation are given for each set of values. In calculating the standard deviation we have employed the method advocated by Bradford Hill (1942), and for valuable help in this connexion we are greatly indebted to Mr. Ames L. Imrie, C.A., Depute City Chamberlain, Dundee.

Discussion and Summary

The Table has been made, so far as possible, self-explanatory. The following observations may be of interest:

(i) Considerable individual variations are a striking feature of the total dietary intakes, due probably to the factor of appetite.

(ii) The mean values per day may be compared with the following standards for boys of the same age group, adopted by: (*a*) the U.S.A. National Research Council (Orr, 1942); (*b*) the League of Nations Commission (Magee, 1943). Calories (*a*) 3,200; (*b*) 2,900; protein (*a*) 85 g., (*b*) 95 g.; vitamin A (*a*) 5,000 i.u., (*b*) 3,000 i.u.; vitamin B_1 (*a*) 533 i.u., (*b*) 435 i.u.; ascorbic acid (*a*) 90 mg., (*b*) 30 mg.; calcium (*a*) 1.4 g., (*b*) 1.5 g.; available iron (*a*) 15 mg., (*b*) 16 mg. The intakes of ascorbic acid and of calcium fall considerably short of both standards, while the intake of vitamin A is well below the suggested American level.

(iii) The high consumption of national-flour bread is responsible largely for the optimum intake of vitamin B_1, and to a less extent for the satisfactory level of protein recorded. Although not shown in the table, an interesting feature was that a large proportion of the admittedly low ascorbic acid intake was derived from potatoes, particularly "chips."

(iv) The school meal furnishes a valuable contribution to the total dietary of first-class protein, vitamin A, ascorbic acid, and calcium, the percentages being 44.4 ± 10.3, 67.8 ± 12.2, 57.8 ± 12.6, 42.3 ± 10.9 respectively. Values for a comparable group of pupils fed exclusively at home are not available, but from our knowledge of local food habits we feel that corresponding figures for a home midday meal would be most unlikely to equal, and would certainly not exceed, the figures given for the school meal.

Table showing Intake of Dietary Constituents for a Group of 39 Boys aged 14–15

		Total Amount Weekly	Total Amount provided by School Meals (i.e., 5 per week)	Per cent. from School Meals	Amount per Day
Calories	R	9,190–28,186	3,163–8,575	20·0–58·5	2,191·6 ± 482·14
	M	15,341 ± 3,375	5,347 ± 1,017	35·68 ± 7·0	
Total protein (g.)	R	375–1,032	126–301	23·4–46·0	76·57 ± 16·41
	M	536 ± 114·90	189 ± 37·24	35·92 ± 6·1	
First-class protein (g.)	R	151–331	65–145	25·7–67·3	33·46 ± 6·48
	M	234·2 ± 45·37	100·8 ± 17·52	44·4 ± 10·3	
Vitamin A (i.u.)	R	10,300–37,800	7,120–20,460	38·2–84·7	2,912·4 ± 762·0
	M	20,387 ± 5,334	13,430 ± 2,655	67·8 ± 12·2	
Vitamin B_1 (i.u.)	R	2,946—7,275	865–2,236	19·2–52·8	588·4 ± 120·14
	M	4,119 ± 841	1,493 ± 237	37·13 ± 7·1	
*Ascorbic acid (mg.)	R	98–199	51–107	32·3–81.6	19·1 ± 3·79
	M	133·7 ± 26·5	75·3 ± 14·1	57·8 ± 12·6	
Calcium (mg.)	R	3,770–10,050	1,340–3,880	25·3–61·0	825·6 ± 192·57
	M	5,779 ± 1,348	2,357 ± 507	42·3 ± 10·9	
Available iron (mg.)	R	47–166	18–48	19·4–53·2	12·06 ± 2·90
	M	84·4 ± 20·3	30·4 ± 5·3	37·17 ± 7·5	
Nat. flour bread (oz.)	R	32–112	—	—	10·7
	M	74·8	—	—	

R = Range. M = Mean. ± = standard deviation.
* The results obtained from three boys during a distribution of oranges, giving values of 69, 58, and 67 mg. per day respectively, are omitted.

(v) The general health of the boys was good. The only lesions possibly attributable to dietary deficiencies were gingivitis (29%) and folliculosis (29%). The relationship of these conditions to the dietary findings is at present the subject of a therapeutic investigation, the results of which we hope to publish later.

Our thanks are due to Dr. W. L. Burgess, C.B.E., and Prof. R. C. Garry for their interest in this work. We are greatly indebted to Mr. Harry Reoch, Headmaster, Trades School, for his keen co-operation.

REFERENCES

Cook, R. P., Davidson, W. A., Keay, D. M., and McIntosh, D. G. (1944). *Biochem J.* (In press.)
Davidson, L. S. P., and Anderson, I. A. (1940). *A Textbook of Dietetics*, Hamish Hamilton, London.
Hill, A. Bradford (1942). *Principles of Medical Statistics*, Lancet Ltd., London.
Magee, H. E. (1943). *Publ. Hlth.*, **56**, 126.
Orr, J. B. (1942). *Proc. Nutrit. Soc.*, **1**, 43.

THE ORDER OF ST. JOHN

The report for 1943 of the Chapter-General, the Grand Priory in the British Realm of the Venerable Order of the Hospital of St. John of Jerusalem, records its gratitude to members of the medical profession who, despite wartime difficulties, continue to instruct and examine classes in first aid. The strength of the St. John Ambulance Brigade at home increased by 11,098 during the year. More than 24,000 members are serving with H.M. Forces, and more than 60,000 with Civil Defence Services. First aid was given to 489,709 persons during the year; and 285,393 patients, including the victims of 9,254 road accidents, were transported in the Brigade's motor ambulances—more than double the 1942 figure.

The St. John Ambulance Brigade over-seas shows a net increase of 204 new Divisions and of 94 Cadet Divisions. In the South Pacific the Queen of Tonga has become an Associate Dame of the Order in recognition of her great services to humanity.

Ophthalmic Hospital, Jerusalem

The report for 1943 of the Ophthalmic Hospital at Jerusalem of the Order of St. John tells of difficulties in administration on account of economic conditions in Palestine. Owing to increased cost of living salaries and wages are constantly rising, and both nurses and domestics are almost unprocurable. As an example of local conditions nurses have left the Bethlehem Mental Hospital to look after their homes, while their parents look after pigs. A sow fetches an enormous price, and some fellaheen who were penniless before the war are now reported to be making several thousands a year. Eggs have cost as much as a shilling each, chickens £1, and butter 10s. a pound. New out-patients show a slight decrease through difficulties of travel, and exceptionally cool weather diminished the number of sufferers from epidemic conjunctivitis. Fewer than usual of these cases were complicated by corneal ulceration. Forty of them were treated by instillations of penicillin, but it proved ineffective. Over 90% of out-patients had trachoma.

SCHEMES FOR MEDICAL AND SOCIAL RESEARCH

The Nuffield Provincial Hospitals Trust (16, King Edward Street, Oxford) has issued a memorandum concerning three schemes of social and medical research which are to be assisted financially by the Trust.

Social Adaptation of Children brought up in Institutions

The Provisional National Council for Mental Health is to receive a substantial grant to enable it to undertake this research, which is to be organized and directed by Dr. F. H. Bodman. The war has brought out very strongly the necessity for making provision in this country for homeless, abandoned, and handicapped children. In view of the acute demand, it seems of the utmost importance to ascertain how far and in what respects the institution child is handicapped in comparison with the child brought up in a normal home. There is a general impression among social workers, labour managements, and psychiatrists, who have to deal with children and young persons, that the child brought up in an institution compares unfavourably with the child who has had the benefit of normal home surroundings. But in this country this is so far an impression only and is not based on scientific inquiry; it is felt, therefore, that it would be extremely valuable to make a definite study of the social adaptation of a group of children and young persons who have been brought up in institutions.

Cancer Research in Sheffield

The Sheffield Municipal and Voluntary Hospital Joint Advisory Committee is the joint body "recognized" by the Trust in connexion with the making of grants for development of hospital and ancillary medical services in the area. On the recommendation of the Joint Committee, the Trust is making a grant which will enable the department of pathology to carry out research on the biological effects of ionizing radiation in association with a group of workers on the staff of the Sheffield Radium Centre. The preliminary work contemplated is to investigate the effect of measured therapeutic doses on the hormonal output of the endocrine glands. This is an attempt to prove or disprove the theory that small doses of radiation have a stimulating action on cell growth and function. The work will be under the direction of Prof. H. N. Green, M.D., of the department of pathology and Mr. G. W. Blomfield, F.R.C.S., medical director of the radium centre. The preliminary work contemplated should have practical importance in revealing more about the origin and growth of cancer, and is likely to extend over a period of about one year in the first instance. At the end of the year the department of pathology will advise whether the research should be continued.

Infant Dietetics: Research in Scotland

In response to an application from the department of child life and health at the University of Edinburgh, and on the recommendation of its Scottish Advisory Committee, the Trust has undertaken to make, over a period of three years, grants towards further research in neonatal and infant problems, to be carried out at the Simpson Maternity Pavilion, Edinburgh. The research [as announced briefly on Sept. 16, p. 390] will be directed by Prof. Charles M'Neil. The grant will cover the salary of a nurse, appointed by the department, to deal with the nutritional and dietetic problems of child life and health, and when trained she will become a teacher of medical students, pupil midwives, and pupil health visitors. The University of Edinburgh and the Royal Infirmary are to co-operate in this experiment, which, it is anticipated, will afford scope for more practical research within the university department in the subject of paediatrics, by providing an opportunity for closer study of the many physiological problems connected therewith, including the question of prematurity, which plays such a big part in the death rate during the first month.

Correspondence

Air-borne Infections

SIR,—Your hospitable columns have latterly given space to discussions of air-borne infection, in particular to comment on the stimulating volume by Prof. O'Hara and to a status report of my own on that subject (1944, **1**, 296; **2**, 82). Although the desirability of ameliorating disease responsible for so considerable a wastage in time, money, and well-being would seem to be self-evident, this desirability is questioned, notably in the persuasive words of Dr. O'Hara:

> "From a sufficiently detached and objective point of view it is possible to look upon the present prevalence of respiratory infection with some satisfaction and equanimity, for it is more responsible than any other factor for keeping the population ready and resistant to that greatest cold—pandemic influenza—which might otherwise be a much more frequent and deadly visitor. . . . The writer prefers to think of them [the costs] as a reasonable price paid for the preservation of some semblance of respiratory resistance, for an initial resistance to invasion may be cheaper to maintain than to dispense with, biologically as well as socially and politically. . . . Let us not be too impatient with our yearly colds: they keep us from becoming immunologically soft, as we assuredly do when we successfully isolate ourselves from them for any long period."

However, influenza virus of Types A and B are currently each being used successfully for active immunization against epidemic human influenza of corresponding type. Cross-protection is not demonstrable between Types A and B. The causal agent of pandemic influenza is unknown. The justification for assuming that the miscellaneous and miserable respiratory episodes of the winter months afford protection against pandemic influenza is therefore not apparent to the present writer. Certainly we would not do well to rely upon such haphazard means. It seems to the writer more likely, indeed, that the emergence of pandemic influenza is preceded by the appearance somewhere in the world of a mutant virus of peculiarly high communicability. In this case the prevailing conditions permitting universal dissemination of respiratory flora are less a safeguard than an invitation to disaster.

Against what, then, might we become "immunologically soft," lacking the banal respiratory infections? There is evidence that the virus or viruses of the common cold do afford some transient increase in resistance, but this does not last for most persons even through a single winter, and can hardly be regarded as of long-range value. Is it against the common bacterial secondary invaders, pneumococci, haemolytic streptococci, influenza bacilli, or staphylococcus? Protection against invasion by each of these bacterial species is known to be specific for type, and fifty-odd types of pneumococci, forty-odd types of *Streptococcus pyogenes*, and at least two types of *Haemophilus influenzae* are now recognized. It is possible that a useful degree of resistance against the prevailing flora might be built up temporarily within an isolated population, such as that on a ship at sea, but in ordinary life, with innumerable opportunities for interchange of respiratory flora at work, on the way to and from work, and in homes and places of recreation, there seems to be little bacteriological or immunological basis for expecting benefit from infection. Moreover, the respiratory pathogens are not well adapted to propagation or even long persistence on normal mucous membranes. Reduction of the means of dissemination of pathogens would unquestionably entail reduction in morbidity and a corresponding reduction in carrier rate and in the prevailing prevalence of infectious agents.

Nor do relevant epidemiologic facts sustain the argument against suppression of the vehicles of respiratory infection. Rates of respiratory disease, as is well known, tend to show a lesser early winter and a greater late winter peak. The early winter peak doubtless reflects renewed exposure of a population with a diminished resistance against certain pathogens, but the peak in the late winter or early spring is characteristically higher with respect both to morbidity and to severity of complications, and this unquestionably reflects the widespread dissemination

during the winter of viral and bacterial pathogens. Finally, there is the actual record (Gafafer, W. M., "Sickness Absenteeism among Male and Female Industrial Workers, 1933–42, Inclusive," *Publ. Hlth. Rep. Wash.*, 1943, **58**, 1250; "Sickness Absenteeism among Male and Female Industrial Workers during 1943, and among Males during the First and Second Quarters of 1944, with a Note on the Respiratory Epidemic of 1943–4," ibid., in the press) showing a steady building up, in the United States at least, of rates of respiratory infection from 1938 through 1943, contrary to the long-range trend. If an effective resistance were purchasable at the price of frequent infection, this should automatically check the rise in infection rates. Infection rates, on the contrary, have continued upward even at an accelerating pace under conditions in the war years. It seems unlikely, too, that abolition of water sanitation or pasteurization of milk would be advocated on the grounds that these measures make us "epidemiologically soft" with respect to intestinal infection, although T. E. Lawrence in his *Seven Pillars of Wisdom* does smile at the expense of newcomers to Arabia because they cannot drink with impunity from desert water-holes. Vaccination can keep the immunologic mechanisms in function, if necessary, more surely and more systematically than can haphazard natural infection.

"Sufficient unto the day is the evil thereof." The evils of respiratory infection are unequivocal; in my belief the means of dissemination of respiratory disease agents should be attacked whole-heartedly, uninhibited by concern over remote possibilities should we succeed beyond our hopes. In fact, what is done in the next decades to understand and control air-borne infection may be taken as a significant index of how well we have learned one lesson of the war—that the broadest possible development of pure and applied science is fundamentally related to national security and well-being.—I am, etc.,

School of Medicine, University of Pennsylvania, Philadelphia. STUART MUDD.

Renal Osteodystrophy

SIR,—Your annotation of Aug. 19 on renal osteodystrophy—the condition called renal rickets in this country—is very interesting, but omits any reference to recent work in this country. The article gives an excellent account of the condition, mainly based on the important paper of Liu and Chu (1943). They found that vitamin D, although of great value in rickets and osteomalacia, was useless in the treatment of renal osteodystrophy, even when given in large doses. It has been stated by other observers that vitamin D is of no value, although György (1928), Duken (1928), Schick (1929), Karelitz and Kolomyzeff (1932) all reported that healing occurred in their cases. We showed in 1938 that the characteristic lesion in the epiphysis was completely healed in two patients. Since then we have treated two patients with success. Sheldon (1943) has also reported healing.

It is of importance to consider why we succeeded while Liu and Chu and others have failed. Our patients were young—8 and 15 years respectively—and both showed the characteristic changes in the epiphyses. Two of their patients, aged 8 and 20, had the epiphysial changes, whilst the other three, aged 20 and over, had fused the epiphyses and showed well-marked osteoporosis, and were therefore rather different. The kidney lesion was severe in our cases and comparable with those reported by Liu and Chu. The dose of vitamin D they used was 12,000 units a day, but this was given only for 20 to 30 days, although in one case it was repeated and in two cases a single massive dose of 1,000,000 units was given without any demonstrable effect. The dose we gave was 3,000 units daily, together with 15,000 units of vitamin A in the case of the youth of 15, but this dose was maintained for 16 months. During this time he grew 6 in. in height and the *x*-ray appearances improved markedly. The dose was then doubled, partly because the amount of calcium retained was not large and partly because he was growing so rapidly; this dose was maintained until his death 14 months later. The rickets had completely healed by this time. The second patient was given 6,000 units of vitamin D with 30,000 units of vitamin A for a period of 14 months, and the *x*-ray appearances of the epiphyses improved greatly. For the last two months of his life he was given 9,000 units of D and 45,000 units of A, and the ulna did not show any signs of rickets on section. The diets used were high in calcium, containing over 1,200 mg. a day, and the inorganic phosphorus varied from 700 to 1,100 mg. a day.

The essential difference between our treatment and that of Liu and Chu is the giving of sufficient alkali to maintain the alkali reserve within normal limits. A low alkali reserve is always present in these cases, as Liu and Chu also noted. We cannot find any evidence that they gave alkali at the same time as the vitamin D, and believe that this omission was responsible for the lack of response to vitamin D during their short experiments. We did not know whether the vitamin D or the alkali was responsible, as we gave both simultaneously, but since then we have treated one patient with alkali alone, with considerable improvement in the kidney function but with no apparent change in the epiphyses.

We do not think that the vitamin A plays any direct part, though it was given to maintain the general health, and Sheldon's (1943) patient healed his rickets without being given any vitamin A. We therefore believe that vitamin D can act only when the alkali reserve is within normal limits. Liu and Chu suggest that a specific inactivation of the vitamin D is conditioned by the renal insufficiency. If this be correct the alkali may act either by improving the kidney function or by keeping the intestinal contents more alkaline. This latter condition must occur, as our patients were given the equivalent of 12.4 and 20 g. of sodium bicarbonate daily. It is said that vitamin D increases the H-ion concentration of the gut and so enables the calcium to be absorbed, and if this is the case it would explain why we found it necessary to give such large doses of vitamin D.

The experiments which Liu and Chu made with dihydrotachysterol (A.T. 10) are very interesting. They found that the absorption of calcium was much improved in two cases, although no alkali was given at the time. It would be most interesting to know whether the function of the kidney improved during this period, and whether the giving of alkalis hindered or helped the absorption of the calcium.—We are, etc.,

GEORGE GRAHAM.
W. G. OAKLEY.

REFERENCES

Duken, J. (1928). *Z. Kinderheilk.*, **46**, 137.
Graham, G., and Oakley, W. G. (1938). *Arch. Dis. Childh.*, **13**, 1.
György, P. (1928). *Jhrb. Kinderheilk.*, **120**, 266.
Karelitz, S., and Kolomoyzeff, H. (1932). *Amer. J. Dis. Child.*, **44**, 542.
Liu, S. H., and Chu, H. I. (1943). *Medicine*, **22**, 103.
Schick, B. (1929). *Amer. J. Dis. Child.*, **34**, 485.
Sheldon, W. (1943). *Arch. Dis. Childh.*, **18**, 194.

Dentition and Diet

SIR,—I was much interested in the article on the improved dentition of London school-children by May Mellanby and Helen Coumoulos in the *Journal* of June 24. I note that no mention is made of the reduced carbohydrate intake in the form of sugar, sweets, cakes, etc., which to my mind is a most important factor. It appears to me that the improvement of the dentition of these children is due not so much to the changes in the feeding habits mentioned but rather to the decreased carbohydrate intake as a result of wartime rationing of sugar, sweets, cakes, etc. Many prominent dental research workers both in England and in America will, I think, agree with this view.

Extensive dental surveys of many thousands of children in South Africa have indicated that caries increases rapidly among both European and non-European children when the sugar, sweet, cake, etc., intake is increased. The difference between the caries-experience rate of children in the north-west Cape, where the staple diet is mutton and bread, and that of the children in the coastal area of Knysna, who eat sweet potatoes, bread, and very little meat, is outstanding. In the former case the caries-experience rate is 40% and in the Knysna area it is 99%. Mention must also be made of the significant fact that the fluorine content of the drinking-water in the north-west Cape is high, while in the Knysna area practically absent.

The report on the South African dental surveys has been published by the Union Health Department, and a copy is enclosed for your information.—I am, etc.,

T. OCKERSE,
Pretoria. Dental Health Officer, Union Health Department.

Bleeding Gums in R.A.F. Personnel: Value of Ascorbic Acid

SIR,—We are sorry that in our reference to the early descriptions of scurvy in our article (Aug. 19, p. 239) we did not make it clear that we were referring to uncomplicated scurvy. As Dr. Glazebrook points out (Sept. 9, p. 353), Lind states that "when a person has had a preceding fever or tedious fit of sickness" the gums may be first affected. These conditions, of course, did not apply to the healthy R.A.F. personnel examined by us. In the description of ordinary scurvy given by Lind, as well as more recently by Hess (*Scurvy Past and Present*, J. B. Lippincott, 1920, p. 176), the gums are specifically stated to become sore and to bleed after the onset of other signs and symptoms (change of complexion, listlessness, breathlessness, pains in joints). McMillan and Inglis, in their recent excellent description of fifty-three cases of scurvy (Aug. 19, p. 233), also say that "bleeding gums were noted on eight occasions, being present only in association with gross changes elsewhere," although these authors apparently did not apply friction to elicit this sign.

The "apparent success in treatment with ascorbic acid" often occurs in experiments with no adequate controls, and our explanation of this apparent success obviously could not apply to the experiment of Roff and Glazebrook, where controls were examined. The condition of bleeding gums with "sponginess," which we noted frequently, seemed, however, to be identical with these authors' "gingivo-stomatitis." We considered whether our results differed from theirs because of the different intake of ascorbic acid, but in some of our experiments the difference was small. (More recent surveys on R.A.F. personnel over-seas have shown no increased incidence even when the intake was as low as 9 to 16 mg. daily.) Because of the different results achieved in two apparently similar experiments we were careful to limit our conclusions to R.A.F. personnel and to state that "this does not exclude the possibility that other subjects living under different dietary conditions might benefit from treatment with ascorbic acid." Is this English sufficiently plain?

The objections raised to our article by Dr. E. P. Evans (Sept. 2, p. 321) can hardly be taken seriously. We and others have carried out numerous saturation tests in which ascorbic acid, administered by the method described in our article, has always produced "saturation" and then appeared in the urine. This could scarcely have happened if the ascorbic acid is destroyed in the mouth or is not absorbed from the alimentary tract, as postulated by Dr. Evans.

Dr. Malik (Sept. 2, p. 328) asks what we mean by "dummy" tablets. The tablets used were made of starch flavoured with tartaric acid, which so far as we know has no effect on any dental disease.—We are, etc.,

W. P. STAMM.
T. F. MACRAE.
S. YUDKIN.

Fracture-dislocation of the Astragalus

SIR,—Squad. Ldr. James's paper (Sept. 16, p. 372) appears misleading in several important respects.

The injury described and illustrated is not a fracture-dislocation of the ankle; it is a fracture of the neck of the astragalus associated with a subastragaloid dislocation, and a complete posterior dislocation of the body of this bone. Nor can this accurately be described as "typical," in that it is only one of the various types of fracture-dislocations of the astragalus. (Ninety-seven such injuries were treated in R.A.F. orthopaedic centres during two years of war; of these only seventeen were of this particular type. R. Watson-Jones, *Fractures and Joint Injuries*, Livingstone, Edinburgh, 3rd ed., 1944, p. 825.)

Treatment of this injury is certainly "to be looked on as urgent." If unreduced, pressure by the displaced body produces necrosis of overlying skin within 48 hours, the skin breaks down, and the body is extruded as a sequestrum. Once the skin has started to break down there is no option but to remove the body, if it is not already extruded, and to immobilize the limb in plaster until infection has subsided and the wound has healed, taking care to maintain contact between the lower end of the tibia and the neck of the astragalus—i.e., to prevent the whole foot slipping forward.

If seen within a few hours of injury, however, I cannot agree with Squad. Ldr. James's assessment of the relative values of the various methods of treatment available. Closed reduction is admittedly not easy, but it is certainly feasible in many recent injuries. If reduction by manipulation proves impossible I have used skeletal traction by an os calcis pin, and inserted a second pin into the displaced body to rotate and guide it back to its socket. This method has since been described by Watson-Jones in his book already referred to (p. 835) and by W. D. Coltart in a paper read to the British Orthopaedic Association, Oct., 1943. Operative reduction should only be employed as a final resort. Removal of the body of the astragalus is preferable to astragalectomy. Not only is the immediate result better but subsequent arthrodesis, if necessary, is easier if the head of the astragalus is *in situ*.

Regarding the relative values of astragalectomy and tibio-calcaneal fusion, in the series referred to above, "the most striking inference was that the results of astragalectomy were uniformly bad and the results of tibio-calcaneal fusion surprisingly good" (Watson-Jones's work, p. 840). As the astragalectomies in the series were performed by a number of different surgeons, it seems unlikely that Squad. Ldr. James's suggestion that "the depreciation of this operation is in large measure due to inadequate surgical technique" is correct.

It is suggested that immediate arthrodesis is the treatment of choice. This would entail arthrodesis of both ankle and subastragaloid joints. Reduction of the dislocation would first be necessary, and operation would be further complicated by the presence of a fracture of the neck of the astragalus. To attempt such a sweeping procedure in the face of the gross bruising and swelling which is always associated with these injuries appears to me to be unduly resolute surgery, even in these days of chemotherapy.

This war has provided an opportunity for the study of a larger series of these very difficult and complicated injuries than has ever before been collected. The conclusions reached have been very clearly expressed by Wing Cmdr. Coltart and Mr. Watson-Jones. It seems a pity that a paper controverting so many of these conclusions should refer to one case only.—I am, etc.,

J. R. ARMSTRONG.

Ely.

Fractures of the Carpal Bones

SIR,—The article on fractures of the carpal bones by my old teacher, Prof. H. A. Harris (Sept. 16, p. 381), was long overdue, and I sincerely hope that it is widely read and thoroughly digested by all those in the profession. One has too often seen these "minor" injuries of the carpal bones entirely missed, and only diagnosed many months later when the damage has been done and cannot be undone—namely, an osteo-arthritic wrist. This is partly due to inexperience and partly to the too infrequent use of radiography in diagnosis. Also it is the oblique view which is so often the one that shows up these "fake" fractures, and so often the clinician omits to have an oblique view taken. It should therefore be taken, as well as the lateral and A.-P. views, as routine in all cases where bony injuries to the wrist are suspected. Prof. Harris states that in Colles's fractures the ulnar styloid is also sometimes fractured. It is generally considered, however, that the ulnar styloid is always fractured in a Colles's fracture, although the lower end of the radius is often fractured without involvement of the ulnar styloid.

It might also be timely to state here that a very similar state of affairs to that which Prof. Harris pointed out as existing in the wrist exists in the ankle. "Flake" fractures often occur at the proximal or distal attachments of the deltoid ligament of the ankle-joint. Either the joint is not *x*-rayed or the radiograph is misinterpreted, and the patient is sent hobbling out as a "sprained ankle." The result of this is prolonged disability. These flakes are sometimes extremely difficult to see, and in cases of doubt the treatment should consist of the immediate application of a walking-plaster. The diagnosis of these fractures is made much more difficult by the presence of an effusion, which makes early *x*-ray most important. In cases of unavoidable delay one should therefore not omit to apply a pressure bandage and an efficient splint with the leg elevated.—I am, etc.,

B. S. SKINNER.

Laryngeal Spasm

SIR,—Fl. Lieut. Heyworth states (Sept. 16, p. 385): "My impression is that once severe [laryngeal] spasm has been allowed to develop, nothing can be done until the false and true cords have relaxed." I can assure him that it is unnecessary to wait until the patient is "pulseless, black, and virtually on the point of death." I have never yet, during a good many years' experience, met a laryngeal spasm which could not be dealt with by intubation with a gum-elastic catheter (urethral for as supplied for purposes of anaesthesia is equally suitable, of about 7 mm. diameter for adults). The smooth rounded end of such a catheter will pass between cords in spasm easily, quickly, and without trauma. I always have several sizes handy when anaesthetizing. As the American gentleman is alleged to have replied when asked why his hip-pocket contained a gun: "I don't need it often, but when I do I need it darned quick."—I am, etc.,

London, N.W.11. STEPHEN COFFIN.

Trypanosomiasis treated with Pentamidine

SIR,—After reading Lieut.-Col. R. R. Bomford's article in your issue of Aug. 26 I feel the time is opportune to add a comment on the place of pentamidine in the treatment of West African sleeping sickness in general, since late as well as early cases may be met with in this country among Europeans returned from West Africa, and some articles which have appeared may have conveyed the impression that pentamidine is the drug of choice. No reflection is intended on Lieut.-Col. Bomford's article, in which he specifically referred to early cases, though in point of fact the case he describes had passed the first stage.

I am at present on leave from Sierra Leone, and can only quote the literature from memory; but I have before me records of nearly 2,000 cases of sleeping sickness treated with various drugs and combinations of drugs, including pentamidine. These cases were re-examined more than a year after treatment; over half were lumbar-punctured before treatment and the cells counted, and in about half both cells and total protein were enumerated at the final examination. They included 192 cases treated with pentamidine and 55 with propamidine. The dosage of pentamidine varied between 8 and 12 daily doses of 50 to 100 mg. No appreciable difference in curative effect was noted between the higher and lower dosages, and propamidine produced very much the same results as pentamidine.

In brief, in early cases with a normal C.S.F. cell count the curative value of pentamidine proved to be only slightly, if at all, inferior to that of a course of antrypol followed by tryparsamide (total of 8 or 9 doses), but the toxic effect of the drug itself was less than some of the antrypol–tryparsamide combinations. Incidentally, such toxic effects are likely to be less pronounced in Europeans than in undernourished Africans. For in-patient treatment pentamidine also has the merit that the doses can be given daily.

In late cases, however, pentamidine showed to great disadvantage, and where the C.S.F. count exceeded 100 cells per c.mm. before treatment about 45% of the patients died within a year, and of the survivors about 75% had definitely abnormal spinal fluids at the time of examination. The corresponding figures after antrypol plus tryparsamide were only about 13% of deaths and 20% of abnormal fluids. Comparing the general run of cases as met with at all stages, 93.5% appeared to be cured after the best combination of antrypol and tryparsamide, but only 73% after pentamidine or propamidine. It is the general experience also of workers in Nigeria, the Gold Coast, and the Belgian Congo that pentamidine is useful in early cases but of very little value once the central nervous system has been affected. In the Sierra Leone series the dividing line lay around 10 to 15 cells per c.mm.

These findings indicate that it is unjustifiable to treat any case of trypanosomiasis with pentamidine alone without first carrying out a lumbar puncture, and that it is still unjustifiable so to treat it if the C.S.F. shows more than a very slight degree of abnormality. In a small-scale trial in Sierra Leone with 53 cases treated by a combination of 5 doses of 100 mg. of pentamidine and 5 of 2 g. of tryparsamide, given concurrently, the results were excellent in late as well as early cases. Either the pentamidine and tryparsamide were given together at 5-day intervals, or the tryparsamide was given at 5-day intervals while the pentamidine was given daily, starting the day after the first tryparsamide. In this way the whole course of treatment was reduced to three weeks. There were no toxic effects beyond the transient symptoms frequent after pentamidine, and the combination appears promising; but the common type of trypanosomiasis in Sierra Leone, even when symptoms are severe, is rather unusually amenable to treatment, and further trials elsewhere are indicated before an authoritative pronouncement can be made. In the meantime it would seem best to continue to use the well-tried combination of antrypol and tryparsamide as a routine for cases with any involvement of the central nervous system.

It is worth mentioning that most of the results published on treatment with pentamidine lose much of their value owing to the fact that the cases have not been followed up long enough. Experience in Sierra Leone has shown that it is not possible, within a year after treatment, to be certain whether cure has been effected, and cases have been met with whose C.S.F. cell count has been normal at six months but has risen again later. Conversely, some cases still showed raised counts at six months which have returned to normal in a year.

The dosage given by Lieut.-Col. Bomford—repeated doses of the isethionate up to the equivalent of nearly 4 mg. of pentamidine per kilogramme—is very high, and most workers do not exceed 2 mg. per kg. when daily doses are given. Though one should exercise caution in applying results obtained on animals directly to man, it is worth recalling that Van Hoof found repeated doses of about 4 mg. per kg. lethal to guinea-pigs, and Daubney and Hudson observed delayed poisoning after pentamidine in only moderately heavy dosage in cattle. In default of sufficient observations on the maximum tolerated dosage in man, such results indicate the need for great caution in employing such heavy dosage, and there is no evidence of which I am aware that anything is to be gained by it in sleeping sickness, though it may be otherwise in kala-azar.

Since writing the above I have come across the paper by Allen, Burgess, and Cameron (*J. Path. Bact.*, 1944, **56**, 217) on the toxic effects of propamidine. They found the lethal dose (LD50) of the dihydrochloride to be 10 mg. per kg. for the goat, 15 to 20 mg. per kg. for the rabbit, and 10 mg. per kg. for the guinea-pig. The isethionate appeared to be only slightly less toxic. One may expect considerably smaller doses to be lethal if repeated daily, and these results emphasize the need for caution in the dosage of the closely allied drug pentamidine in man.—I am, etc.,

Wootton Courtenay, Minehead. R. D. HARDING, D.M.

War Malaria and its Treatment

SIR,—In the letter on war malaria and its treatment (Sept. 9, p. 351) we read: "It is necessary to continue with small doses of quinine by the mouth—10 to 15 gr. daily—for three weeks or longer. I certainly believe that small doses of pamaquin—0.04 g. daily—in addition to quinine, also aid in preventing relapses." Did the writer intend that pamaquin—0.04 g. daily—should be administered for as long as the quinine—namely, three weeks—instead of the usual five to six days? He later goes on to say that "quinine (30 gr. daily) for two days, mepacrine (0.3 g. daily) for five days, followed by pamaquin (0.03 g. daily) for a similar period, appears to be inadequate."—I am, etc.,

Kilmarnock. H. M. OWEN.

Specialties and Diplomas

SIR,—There must be diversity of view about the problems of postgraduate medical study, but I think that Major-Gen. Max Page's kindly dissent from some of my views is based upon misunderstanding, for which a lack of clarity on my part may be responsible.

Of course I do not include the F.R.C.S. or the M.R.C.P. among the mushroom growth of specialist diplomas, though I am not persuaded that they are noticeably concerned with the basic sciences of medicine. Also, I have not advocated the abolition of the special departments of general hospitals, but rather the necessity for conducting higher studies and research in certain branches of medicine in special hospitals and schools. I have served on both special department and

special hospital, and believe that the functions of the two are different and cannot be merged in the special department of the general hospital, large or small. No one disputes that all branches of medicine are but parts of a whole, but the argument has no bearing upon the expediency of devoting special institutes to some of them. It is not for me to argue the status of dermatology as a special branch of medicine, but the notion that the skin is just the wrapping of the human parcel, occasionally betraying the disquiets of its contents, does scant justice to a very complex organ, and I should have thought that few branches of medicine more urgently required intensive study in a special institute.

There is, however, a misapprehension in his letter that is none of my making, as when he suggests that had those who have worked in the National Hospital shown themselves as interested in disorders of the functions, as in those of the structure, of the nervous system, medicine would have benefited even more. This is a surprising comment upon the hospital of Hughlings Jackson, Ferrier, Horsley, and others since their day whom I need not name. Surely, too, the essence of neurological diagnosis is the study and analysis of disorders of nervous function, from which alone, clinically, can the seat and nature of structural disorder be determined. Casting round in my mind for some explanation of this false idea of the history and nature of neurology, it occurs to me that Major-Gen. Max Page has confused two very different notions —namely, physiological and psychological disorder—how different the psychologist will be eager to tell him. Even so, I venture to suggest that he is rather out of touch with the facts. Thus, in this war as in the last, major contributions to the problems of psychological stress in air-crews have come from distinguished members of the hospital staff.

However, in so far as he is in favour of the still more intense study of psychological medicine in the hospital, I am with him. Up to date, as a leading psychiatrist has stated before the Goodenough Committee, "the accurate knowledge possessed by psychiatrists of mental disorders and their treatment is still of modest dimensions," and no one can doubt that neurology has an important contribution to make to the subject.—I am, etc.,

London, W.1. F. M. R. WALSHE.

SIR,—Conversations with medical colleagues have convinced me that Dr. Walshe's article (Sept. 2, p. 297) must rank as one of the most candid, stimulating, and reasoned essays of recent years. Already it has moved some of the senior members of the profession to reply. The article is extremely opportune, and merits full discussion from all points of view. It is as one of those who did not, at the appropriate time, as Dr. Walshe says, "acquire those alphabetical adornments that we have asked of those to whom we have offered opportunities in consulting and academic medicine" that I lay a claim to take part in the discussion.

With my due respects to Mr. Max Page (Sept. 16, p. 384) I think Dr. Walshe presents the case for and against postgraduate diplomas very fairly and reasonably. Is not the F.R.C.S. a postgraduate diploma? Talking of this and the M.R.C.P. Mr. Max Page says: "These diplomas are generally accepted as evidence of a man's sound training in the basic sciences and his subject." With certainty, much better evidence could be obtained from a detailed inquiry into his work and interests from school upwards. Further, Mr. Max Page remarks: "Few would regard them as more than that." May I respectfully suggest that that is not the opinion of the general public, local authorities, or even the majority of the medical profession.

Many agree with me that we might gain something from the adoption of Continental methods. Surely five years' suitable postgraduate experience could constitute not merely evidence but proof of a person's suitability or otherwise for consultant or academic medicine. A good surgeon needs a deft pair of hands, a suitable temperament, and a sensitive conscience. An examination track mind is not necessarily an asset.

I understand that the regulations for the F.R.C.S. have been altered recently. There may be some good reason that I, for one, do not know of, but it would rather suggest that the "oldest and best established" were not, after all, the best. In spite of the fact that it was not an essential for a candidate for the F.R.C.S. ever to have performed a major surgical operation, nevertheless the possession of that diploma is a *sine qua non* in most hospitals for appointment to the surgical staff. Thus, whatever a person's ability and experience he is barred from being an applicant if he cannot show proof in the way of a diploma that he has been a house-surgeon. Perhaps Mr. Hamilton Bailey will forgive my quoting from the preface to his book on *Emergency Surgery*. "I had now climbed another rung, and found myself on the junior honorary staff of a teaching hospital, with plenty of time to write, but with hardly any emergency operations to stimulate me to do so. Commencing to form the early chapters, I came to the conclusion that my experience was still insufficient, and it was largely on this account that I descended the surgical ladder, and once again became a resident surgical officer, this time at a very large hospital in Birmingham. Here I was afforded unique experience in emergency surgery." Due reflection on these comments must leave some of us apprehensive, particularly when the subject of teaching is up for discussion.

Dr. Walshe's cryptic reference to original articles is very much to the point when he states: "And the author, especially if he be young, who ventures daringly to attempt some generalization or synthesis of his findings with those of other workers is in danger of having his contribution declined." Having suffered thus, I am bound to complain that this state of affairs is beyond an average comprehension. Any sincere worker would welcome any criticism of his observations and conclusions provided such criticisms are supported by appropriate evidence. And if there remains only a small contribution to learning, surely the profession should be glad of it.—I am, etc.,

Wembley. J. SHIRLEY CALLCUTT.

Present-day Medical Education

SIR,—This is the view-point of a product of present-day medical education. I cannot speak as a representative of the views of young practitioners, because we have no uniform views any more than experienced general practitioners or clinical teachers have such views. I cannot accuse my teachers of hiding behind laboratory results. They knew what they wanted the student to do: they wanted him to master the technique of interrogating and examining a patient and to learn to think. From pre-clinical times it was dinned into us that we were going to reach our conclusions via our eyes, our ears, and our finger-tips. The wards, the out-patient departments, and the practical classes were stressed as far more valuable than the systematic lectures. Pity the man who, when asked how he would diagnose a condition, replied first of all with a laboratory examination!

And what about the finished product? Personally, I qualified less than a year ago, and still feel unfit to attempt large classes of patients such as are met with in general practice. Four or five months as a house-surgeon and the same period in the Army have brought home to me two outstanding facts: the number of cases I cannot diagnose, and the even greater number which I cannot treat to my satisfaction.

Over half of these failures can be laid at my own doorstep: ignorance, insufficient care or patience, and sometimes the easy classification of a case as "functional." This still leaves a large number unaccounted for. Some of these could have been successes given different medical training. Too little time is paid to treatment, especially local treatment, and too little attention to the diagnosis and prognosis of those cases with symptoms but no signs. How many of my contemporaries can dismiss a patient with the confident assurance that there is nothing wrong with him?

The cure, in my opinion, lies after the final examination rather than before it. A year's compulsory hospital residence? Certainly; and let there be sufficient emphasis on out-patient work. But still more is a year's apprenticeship in general practice required for all doctors, no matter what they may eventually tackle. The training of efficient G.P.s is more difficult, and promises bigger dividends in national health, than the training of specialists. I have heard specialists regretfully admit that they have had too little general training; but I have yet to hear one say that he spent too long a preliminary period in general practice.—I am, etc., H. A. LANG.

Observation in the Student's Training

SIR,—In his most interesting article (Aug. 26, p. 284) Dr. Ff. Roberts emphasizes that the modern student, instead of asking himself what he actually sees, asks himself what he should see. This outlook is encouraged at the present time by the variety of labels attached to diseases and syndromes. In many schools the student who can recite parrot fashion the varied nomenclature of such diseases as thrombo-angiitis obliterans is looked upon with favour. Naturally his classmates endeavour to emulate him. Until the end of the Dark Ages almost all academic thought centred on the teachings of the ancients. While Plato and Aristotle were studied intently the emphasis was on the purely intellectual interpretation of these men's work, and their conclusions were considered as the be-all-and-end-all rather than as indications for further work, both observational and theoretical. With Galileo, Newton, and their contemporaries we witnessed the birth pangs of the age of accurate observation. At the present time we seem to approach the twilight of this age.

Whitehead has divided the scientific approach into three stages: the stage of description, the stage of classification, and the stage of measurement. At the present time, in the medical field, some workers are concerned with the first stage, some with the second, and many with the third. For results to be of value and not subject to almost immediate contradiction, careful and full observation is of supreme importance at each stage.

As a background to all this comes the question of interpretation, and for this sound reasoning—inductive and deductive, as emphasized by Dr. P. T. Macdonald (Sept. 9, p. 354)—is of paramount importance. Dr. Macdonald does not seem to appreciate, however, that a mighty intellect working on wrong observations may be made much more of a hindrance than a help. Much importance is attached to the conclusions of the great minds, but these are only of value in so far as they are based on accurate and painstaking observation. At the present stage of medical development we are far from being able to dispense with those relatively neglected but very useful instruments the human eye, the human ear, the human fingers, and the human nose. In how many, alas, these are the eyes which look but do not see, the ears which listen but do not hear, the fingers which touch but do not feel, and the noses which sniff but do not smell!

The reason for the accumulation of undigested facts is that the present generation is being trained on absorptive rather than observational lines. As time goes on, many of these undigested "facts" are found to be fallacies. The trained observer can spot a fallacy much more quickly than the student who can recite large portions of Cunningham, Gray, or Price verbatim, but who is often incapable of recognizing before him the conditions with whose theoretical aspects he is well acquainted. I believe Dr. Macdonald would agree that Michelangelo, Leonardo da Vinci, Shakespeare, Dickens, and (more near our own time) Rutherford, Lister, and Elliot Smith were all shrewd observers, and that no small amount of their permanent contribution to knowledge, thought, and art was the result of painstaking observation.

The teaching of accurate methods of thought is more difficult than the teaching of observation—as witness the powers of observation of most young children. That these studies are complementary and not antagonistic would be admitted by most. Let us start our reforms with emphasis on the powers which tend to atrophy, but not forgetting the importance of the powers we can acquire—namely, those of accurate thought.—I am, etc.,

JOHN GRIEVE,
Squad. Ldr., R.A.F.V.R.

Limitations of Current Medical Training

SIR,—In his letter on limitations of current medical training (Sept. 16, p. 382), Dr. Robinson restarts the old argument of old methods versus the new, and although there are some elements of truth most of the remarks can be criticized.

It is quite true that in teaching hospitals many of the pathological tests which are performed are quite unnecessary, but in most of the cases the diagnoses have been made and the laboratory tests are done merely to show the student the complete picture of the disease. The young doctor who goes into practice thinking that diagnoses can only be made by tests rather than by examination of the patient is the exception and not the rule.

The third and fourth paragraphs appeal to me, being an unfortunate R.M.O. He states that lobar pneumonia was diagnosed on the wrong side due to laboratory findings. I should be interested to know what investigations give one the diagnosis of lobar pneumonia except an *x*-ray examination, which would hardly give the wrong side. He then states that both the patients, being dosed immoderately with sulphapyridine, developed lung abscesses, this not being unexceptional. I feel that lung abscesses following lobar pneumonia are very exceptional, and I should like to know his reasons why immoderate dosage should cause such a condition. As an R.M.O. one so often reads in doctors' letters that sulphonamides have been given—tabs. two t.d.s.—it being very unusual to find that it is the house officer who gives the wrong dosage.

As for the typical remarks about cardiac murmurs, at my London teaching school (and I do not believe that this is the only exception) we were taught the relation of cardiac murmurs to the pathology of the cardiac condition, but it was stressed that murmurs were not the be-all-and-end-all of cardiology.

In the last but one paragraph the house officer gets it in the neck again. It was stressed throughout the whole of his teaching that he should not, if possible, reduce a dislocation without an *x*-ray examination, not because he is unsure of his diagnosis but because of concomitant fractures being unrecognized and the intricacies of the law courts.

To finish, I should like to know how many old practitioners with the aid of physical signs can differentiate between 75% and 100% haemoglobin, this being of importance in a case of pernicious anaemia where the threat of subacute combined degeneration is not always so far distant. I feel that 265 blood counts could just possibly be performed on such a case over many years, but to say that this is a typical example of modern methods is, I feel, a little over-exaggerated, as is also, I think, the whole of Dr. Robinson's letter.—I am, etc.,

High Wycombe Hospital. RICHARD STURTON.

SIR,—I should like to make a few comments on Dr. Henry Robinson's letter.

I agree with his remarks about specialization at an early age. I was swept up by the Army six months after qualifying and was quite unable to start on the road to specialization and am duly grateful. I now see all sorts of complaints and am learning the great importance to the individual of the trivial. But when he starts to criticize the abilities of the young doctor he paints a picture of unmitigated gloom, only relieved by touches of sheer balderdash. I have never seen or read before of lung abscess as a direct result of sulphapyridine overdosage. What is the scientific proof for this amazing statement? It sounds like pure intuition on the part of the "old physician." In my experience it is far commoner for sulphapyridine and other sulphonamides to be given in too small rather than too large quantities.

His remarks about the diagnosis of cardiac disease are true of physicians of all ages. But we were always taught that a murmur gives no indication of the efficiency of the myocardium, but it may give an all-important clue to the aetiology of a given case of cardiac failure, and thus have a very important bearing on prognosis.

It was also always insisted by my teachers that we should take a full history and make a thorough examination before we ever thought about laboratory tests. *X*-ray and other examinations, not forgetting those carried out in the "Temple of Verities," the post-mortem room, are an essential check on one's physical signs. Those who use these aids frequently and intelligently find out how often they are wrong and learn to do better in the future. Those who do not, remain in blissful ignorance and are a menace.

Lastly I should like to express a word of admiration for the persistence of the poor fool who carried out 265 blood counts on one individual. Perhaps he discovered some important variations in the healthy blood picture, which I hope he will duly publish.—I am, etc.,

I. S. STADDON.

Refresher Courses for the G.P.

SIR,—Dr. Walshe in his article (Sept. 2, p. 297) looks to the replanning of the conditions of medical practice rather than the refresher course to help the practitioner keep abreast with the advancement of medicine. Unfortunately it is doubtful whether such an ideal state of affairs can be brought about in the near future, and so the following is suggested as an alternative method of achieving the same result.

General practitioners, who naturally have little time to spare for refresher courses and little inclination to upset their regular work, do find they have an occasional hour or two to spare on some afternoons in the week. Surely postgraduate study could be arranged to coincide with these spare times? The type of study that appeals to the practitioner is that which most nearly approaches his own work—i.e., a clinical round in a hospital. Therefore, if all the hospitals in any area held a clinical round for practitioners, each on different afternoons in the week, when members of the staff demonstrated medical and other cases at the bedside, the practitioner living in a large city like London would always find a local hospital where a clinical round was being held at the time he happened to be free.

Regular instruction of this nature throughout the year is the best method of postgraduate training, and at the same time leads to better co-operation between practitioners and hospital staffs. The benefits of such a plan to all concerned were obvious to those who attended such a weekly round held before the war at St. Mary Abbots Hospital, L.C.C., Kensington, by the great initiative of the medical superintendent, Mr. James Carver.—I am, etc.,

London, W.8. H. STEPHEN PASMORE.

Cancer Clinics: Beware

SIR,—While clinics have their uses, they can be overdone. In the case of venereal disease they serve well, but there the symptoms are usually unmistakable. It would be the very reverse with a disorder so protean in form as cancer, in which the early stages are apt to arouse but little suspicion of their sinister significance.

The public is painfully aware of the hideous later stages of cancerous disease, but knows little of its inception. Yet often in the early stages it is curable. But will the cancer clinic get patients in their early stages? No! since the patient does not recognize that he has cancer, and the idea of consulting a cancer clinic will never enter his head. Even if his suspicion is aroused, he will be inclined to shun a place labelled "Cancer Clinic." Finding something wrong with himself and wanting a remedy, the patient naturally resorts to his general practitioner. Therefore *he* is the man to make responsible for diagnosis. When the family doctor is fully alive to his responsibilities and maintains full competence in diagnosis the patient stands the best chance of early detection of a cancer. Having known his patient previously, the doctor can view complaints in their proper perspective, which makes for quick and sure diagnosis. Moreover, the family doctor, deprived of such an important function, would lose interest, and his proficiency in diagnosis would deteriorate. Already rival services, such as infant welfare, school, and industrial clinics, tend to diminish his influence.

Not only in diagnosis but in psychology the doctor at a cancer clinic is at a disadvantage. The family doctor knows his man and the tactful way of dealing with a solemn and delicate situation. To one he is candid, to another he may hint at possibilities, while with timid or neurotic folk he excludes the slightest reference to cancer. Thus he wins the patient's confidence and willing co-operation. Once diagnosed or suspected, the case is directed to the appropriate consulting specialist for confirmatory opinion and treatment.

As already shown, special clinics dotted about the country are of little practical value in this campaign, as but a few of those for whom they are intended would avail themselves of the service. On the other hand, they would certainly do harm by initiating or fostering thoughts of the disease in those inclined to a cancerous obsession. Already cancerophobia is notorious. The existing machinery clearly contains the elements for a successful campaign—all we need is more of it. In regard to the present shortage, the bald facts are that the uninsured public can't afford their doctor, and he can't afford the time. Patients won't incur expense for a slight illness. Yet the tantalizing fact is that operating early offers the one great chance of cure. The doctor's difficulty is that he has too crowded a surgery, and cancer calls for detailed study of symptoms and deliberate examination in adequate space, light and warmth. Now, however, the Government promises to remove the financial handicap by a national health insurance scheme for every man, woman, and child. But money alone cannot provide the much-vaunted first-class service for all. We are bound to wait for the training of personnel. Time—7 years minimum—is needed to double the meagre ranks of the profession, just as time was required before we could convert our inadequate Air Force into a potent one.

Once the diagnosis is established and treatment arranged a third requisite remains. The case must be pursued throughout the patient's life. This is necessary to detect possible recurrence promptly and nip it in the bud, to observe the effect of treatment, and for statistical study of the disease. The general practitioner is the one most interested, and he can readily make regular observations. A special supervisory department of the public health service would be responsible for collecting official records and statistics, and would ensure that regular reports reached its office. It would be compulsory for the general practitioner to send returns annually or as often as required, and to direct the patient for a consultant's opinion as occasion demanded. From the mass statistics compiled conclusions of far-reaching significance would emerge. Such a perfect follow-up system would ensure that the doctor's interest was maintained and would give the patient full confidence and satisfaction.—I am, etc.,

Bristol. A. WILFRID ADAMS.

Lay Psychotherapy

SIR,—By way of illustrating Dr. D. Stanley-Jones's admirable letter (Sept. 2, p. 322), may I state briefly what is being done by one small body to provide doctors with skilled psycho-therapeutic auxiliaries? The Guild of Pastoral Psychology was founded some years ago by a number of doctors and clergymen who felt a growing double need: among doctors, busy and untrained in psychotherapy, for workers who could help patients with personality disorders as distinct from definite mental illness; and among clergymen and teachers for sound guidance in the principles of psychology, to enable them to do their own life-work more effectively. The Guild's policy is to explore the wide common ground between psychology and religion, and its publications now cover a very respectable field. It promotes lectures and study groups, and has made a start with the difficult and delicate task of instituting a higher qualification. A "Fellow" must, unless for quite exceptional reasons, be a doctor, a clergyman, or a qualified psycho-therapist; he must have passed a stiff written examination, had a thorough personal analysis, and trained under expert supervision at probation work, psychiatric out-patients, or some other recognized form of practical social psychology. Candidates are very sparingly hand-picked by the executive committee. A Fellow may not display his fellowship as a qualification. The Guild sets its face against creating a class of non-medical persons who would conceive themselves qualified to practise quasi-medical psychotherapy. It considers that any minister who wishes to practise professionally as a psychotherapist should conform to the standards laid down by recognized schools for lay psychotherapists. Its policy is to co-operate with medical practitioners and help them by all possible means in the difficult days which lie ahead, when neurosis will be rife and those who can cope with it will be few and over-worked.—I am, etc.,

D. H. KITCHIN,

London, S.W.19. Hon. Treasurer, Guild of Pastoral Psychology.

Mass Radiography

SIR,—Your reprint *re* mass radiography in the *Journal* of Sept. 9 (p. 350) shows a desire on the part of the Ministry of Health to retain mass radiographic procedure in their own hands, with no departure from the particular method and apparatus they have sponsored. Question definitely arises whether the method they have selected is the best, and, unless this is the case, use of alternative methods should not be prevented by official disfavour.

In an editorial, *Radiology* (1942, **38,** 498) discusses the relative value of 14 in. × 17 in. films (12 in. × 15 in. films are more commonly and economically employed in Britain), 4 in. × 5 in. films (as employed in the U.S.A. in mass procedures), and 35-mm. films as employed in this country by the Ministry. This editorial summarizes that full-size films are the most accurate, 4 in. × 5 in. films next, and 35-mm. films "should also be considered, but do not deserve such a high rating as the other two." Kerley (*Brit. J. Radiol.*, 1942, **15,** 346) states: "Miniature radiography does not compare in detail with the full-size picture, hence the method is restricted to sifting cases of comparatively gross disease." Saupe (*Fort. a. d. Geb. d. Roentgenstrahlen,* 1940, **62,** 145) on the basis of 25,000 cases of miner's pneumonokoniosis considers the fluorographic method as unsatisfactory for the study of asbestosis. Bailey (*Radiology,* 1942, **39,** 306), having used normal and 4 in. × 10 in. stereoscopic films for examination of U.S.A. recruits, states that since most time is taken in positioning the recruits there is no time economy with miniature films. The claims for 35-mm. films based on film cost as compared to 12 in. × 15 in. (invariably based on small film-purchases instead of by thousands) evade the fact that the film cost is only a fraction of the total establishment expenses. Magnification of 35-mm. films cannot be increased to approaching normal size without the emulsion grain obscuring the detail, of utmost importance in early lesions.

To popularize mass radiography articles have been published in the popular press (*Picture Post,* Feb. 12, 1944), but nothing is stated that such examination cannot give immunity to later infection. Hence a false sense of security is given. At a Rotarian luncheon to which I was invited a lay lecturer gave one the impression that such examinations may be carried out by laymen only. Question strongly arises whether in practice secrecy can be maintained.

With the possibility of hostilities ending there is already a reaction against regimentation in normal life and, in respect to tuberculosis, question arises whether propaganda should not be preferably directed towards the more early radiological examination of clinically suspicious cases with full-size films, at hospital or in private, at the instance and under the consideration of the patient's private medical attendant, with resulting secrecy. The private medical attendant can best decide, on the basis of the report and his clinical observations, whether care and notification are necessary, or only an old lesion is being dealt with and secrecy can be maintained without danger to others. Once these cases become "official," routine home inspections, loss of work-time for periodical clinic attendances, etc., result, with publication of the patient's past condition and detriment to his present economic position. If one can judge by the difficulty of obtaining an impartial board which exists in respect to those enlisted in the Services and suffering from definite conditions, with many months before proper discharge, to remove the official classification of tuberculous will be equally difficult, particularly if the Ministry is to dictate the mode and technique of examination.—I am, etc.,

London, E.7. BERNARD LEGGETT.

Service Medicine

SIR,—My reaction to Dr. P. B. Corbett's letter (Sept. 9, p. 355) is a desire to point out that as a civilian medical practitioner he is only on the very fringe of Service medicine, and is not in a position to express a true opinion as to its merits or demerits. The number of beds in his sick quarters suggests that he is in charge of a very small station, and is therefore acting in the place of a very junior M.O. He probably does not realize the large amount of paper work that even his small station causes his Wing S.M.O. It is well known that junior M.O.s and C.M.P.s are not delegated the "responsibility" of paper work, and have more time to devote to the rare case, presenting a clinical aspect of any interest, during the short time that it may remain in the sick quarters. In this they are more fortunate than their slightly more senior and more numerous brethren.

It is only partly true that the "crux of the matter is that the medical orderlies must know and do their part." It is my experience in five years in the R.A.F. during the war and one year in the Volunteer Reserve, and two C.M.P. appointments before the war, that it is rare to find orderlies who have the conation or volition to be trusted with more than menial tasks, and that to leave even the routine paper work entirely in their hands is to invite a shower of abuse and a visit from the Group S.M.O. A good staff is admittedly very helpful, but the very best cannot absolve the M.O. from the tedious completion of forms and procedures that are his sole responsibility. For example, to send an officer on sick-leave four forms must be completed in manuscript, of which no fewer than fifteen copies must be personally checked and signed. The completion of board action on an airman or airwoman on F. 496 with M.P.B. 204 is equally tedious but necessary for the proper compilation of R.A.F. records. This form eventually bears the signatures of six medical officers (surely they could be better employed). As a C.M.P. Dr. Corbett would never come in contact with more than the initial phase of these procedures. Another aspect of Service medicine of which he is, in all probability, happily oblivious is that of stores. The Service medical officer in charge of a station is responsible for everything in his sick quarters, even to the electric light bulbs, as he may find to his own financial disadvantage if he is negligent. To be classified as careful in this matter entails no small amount of time and labour spent in holding frequent "checks."

I could continue with examples such as these certainly *ad nauseam* if not *ad infinitum.* I am not entirely destructive in my criticism, and I heartily endorse Dr. Corbett's suggestion to provide the G.P. with a secretary to enable him to "have more time to devote to the clinical aspect of medicine," which (here I beg to contradict) is *not* the case in Service medicine, as I hope I have already made clear. Let us be under no delusion, lest the red tape of Service medicine should be adapted to fetter civilian practice to the detriment of the care of the public.—I am, etc.,

"SERVICE DOCTOR."

Thumb-sucking

SIR,—One of the lessons experience has taught me is never to be "oracular" with regard to medical matters. I particularly used the words "no doubt *in my mind*" for this reason. I have no wish to claim more than the right to express my own honest, considered opinion regarding the harmfulness of persistent thumb-sucking. That opinion is founded on the detailed clinical observation of 3,400 children examined in the speech research, and on the clinical impression of 20 years' practice among children of all ages, involving the inspection of some 8,000 mouths each year. Some of these children I have now been able to re-examine at intervals throughout their entire school life from the kindergarten to the sixth form.

I am deeply interested in Dr. Colin Edwards's contrary clinical impression (Sept. 16, p. 387), and would be sincerely glad to know the scope of his own experience. But, Sir, what exactly is a "flesh-mortifier"? Am I supposed to be one? I hope not. It sounds very disagreeable.—I am, etc.,

Manchester. MARY D. SHERIDAN.

The Services

Capt. W. R. Dalziel, R.C.A.M.C., has been awarded the M.C. in recognition of gallant and distinguished services in Italy.

The Efficiency Decoration has been conferred upon the following officers of the Territorial Army: Lieut.-Cols. A. M. Campbell and D. P. Levack; Majors (Temp. Lieut.-Cols.) M. DeLacy, H. G. Garland, and W. E. Orchard; Majors J. C. C. Howe, R. G. Morrison, and L. D. Williams; Capt. (Temp. Major) C. S. France.

Capt. W. L. Wainwright, Home Guard, has been appointed M.B.E. (Military Division) in recognition of gallant conduct in carrying out hazardous work in a very brave manner.

CASUALTIES IN THE MEDICAL SERVICES

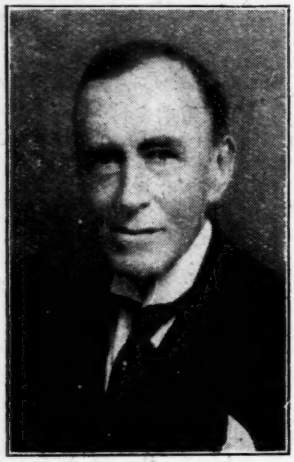
Capt. ROBERT ALASTAIR BOYS KINLOCH, R.A.M.C., previously reported missing in Burma, is now known to have been killed in action. He was the second son of Dr. R. Blair Kinloch of St. Albans and studied medicine at St. Thomas's Hospital, qualifying M.R.C.S., L.R.C.P. in 1941. He joined the R.A.M.C. as a temporary lieutenant in January, 1942.

Obituary

SIR HUMPHRY ROLLESTON, Bt., G.C.V.O., K.C.B.

Former President of the Royal College of Physicians

With the death of Sir Humphry Davy Rolleston on Sept. 24 there has passed from our midst a physician who helped to sustain the literary tradition of British medicine which began with Linacre. But those who came within the wide circle of his friendship mourn even more deeply one who attracted and retained to an unusual degree the affection and confidence of his fellows. From the record of the offices he held and the work he did, as clinician, teacher, writer, and man of affairs, almost every hour of every day must have been fully occupied, yet his courtly bearing and manner always conveyed the leisure and dignity of the old school. All the best traditions of his profession, its courtesy, its learning, its uprightness and devotion to truth, met in him. He was a teacher who had much to impart, but he remained to the end a humble learner, with a zest for fresh knowledge concerning things new and old.



His family descended from a branch of the Rollestons of the village of that name in Staffordshire. Sir Humphry's grandfather, the Rev. George Rolleston, was a fine old man of the almost extinct parson-squire type, who until his death in 1868 held the family living and also looked after the small estate at Maltby in the West Riding. His son, George Rolleston, M.D., F.R.S., qualified at the age of 21, served as a medical officer in the Crimean War, returned home to become physician to the Radcliffe Infirmary at Oxford and Lees Reader in Anatomy at Christ Church, and in 1859 was appointed Linacre Professor of Physiology. George Rolleston was a dominant and gifted man, one of the earliest, if not indeed the first, to relate biology to chemistry. He married Grace, the daughter of Dr. John Davy, whose deep attachment to his brother Humphry, the famous chemist, inventor of the safety lamp and discoverer of Michael Faraday, makes a pleasant chapter in biography. George and Grace Rolleston settled in New Inn Hall Street, Oxford, and had a large family. Their eldest son, named after his mother's uncle, was born on June 21, 1862.

Humphry was educated at Marlborough, a school for which he cherished a lifelong affection, shown in later life by his presidency of the Marlburian Club. From Marlborough he went to St. John's College, Cambridge, of which he became a Fellow, afterwards an Honorary Fellow. At Cambridge he made friendships with several men who were to become famous in his profession, notably Donald MacAlister, eight years his senior, then medical tutor at St. John's. Rolleston gained first-class honours in both parts of the Natural Sciences Tripos, and then went on to St. Bartholomew's Hospital. He qualified for practice with his Cambridge M.B. in 1888 and proceeded M.D. in 1892. After serving as house-physician and demonstrator of anatomy at Bart's, during which time he wrote jointly *A Manual of Practical Morbid Anatomy*, derived from his experience of the post-mortem room, he became attached to the visiting medical staff, first of the Metropolitan Hospital, and then of St. George's and the Victoria Hospital for Children. No opening in the succession at Bart's was then within sight. He filled teaching posts in pathology at St. George's and had been demonstrator of pathology, physiology, and anatomy at Cambridge. At Cambridge he came into association with Sir Clifford Allbutt, who had recently been appointed Regius Professor of Physic there. Allbutt had been a friend of Rolleston's father, and now between the older man and the younger there began a close friendship which lasted until Allbutt's death thirty years later. In the preparation of his famous *System of Medicine* Allbutt was greatly assisted by Rolleston. The work first appeared, in eight volumes, in 1896–9, and a revised edition, in eleven volumes, with Rolleston's name associated with Allbutt's in the title, in 1906–11. In both editions of this work, which still holds its place among the chief encyclopaedic medical works in the English language, Rolleston wrote several of the articles, notably those on alcoholism, diseases of the oesophagus, the small intestine, the adrenal glands, the spleen, and the lymphatics.

Meanwhile, in 1898, Rolleston was appointed physician to St. George's and held the active post for twenty years. When he retired from the full staff in 1919 under the rules of the hospital he was appointed emeritus physician for his lifetime, with the privilege of using cases in the wards for clinical teaching. He was also made a vice-president of the hospital. In 1925, on the death of Sir Clifford Allbutt, he was appointed to succeed him as Regius Professor at Cambridge. There could have been no more fitting appointment to that famous chair, with its four hundred years' history, than the man upon whose shoulders the mantle of Allbutt had so obviously fallen. He acquitted himself in it, as in all his positions, with distinction, and retired, under the newly imposed age limit, at seventy. In the year of his retirement he published a biographical history of the Cambridge Medical School, having already written a full-length life of Allbutt.

For a period of eight years, beginning before his election to the Fellowship in 1894, he was an examiner for the Royal College of Physicians. He also examined in medicine at various times for the Universities of Glasgow, Oxford, Cambridge, London, Durham, Manchester, Bristol, and Sheffield. He served the Royal College as councillor and censor, and finally, in 1922, as President, a position he held until 1926. His annual presidential addresses to the College during that period have been published, each of them a careful and complete disquisition. During the same period he represented the College on the General Medical Council, and later, on his appointment to Cambridge, he continued a member of the Council as representative of that University until 1932. As far back as 1895 he was Goulstonian lecturer to the Royal College, discoursing on the suprarenal bodies, which at that time were attracting much attention, so that it was opportune to review the state of knowledge concerning them. In 1919 he delivered the Lumleian lectures, taking as his subject cerebrospinal fever. In 1933-4 he was Fitzpatrick lecturer, and dealt with the history of the endocrine glands. In 1936 he expanded these lectures into an extensive monograph with a historical review. His Lloyd Roberts lecture in 1933 was on the association of medicine and literature, a subject that always charmed him. He delivered the Harveian Oration in 1928 on cardiovascular diseases since Harvey's discovery.

Sir Humphry Rolleston's work as a writer, a historian, and, perhaps most of all, a bibliographer deserves a separate memoir. At its best his literary style, like his penmanship, was neat as an etching. His care for dates and reference might have seemed to some people to amount to pedantry; but it was a part of his scrupulous courtesy. To be accurate with regard to names, dates, facts in general is, after all, a compliment which the writer owes to those who read him and to those about whom he writes. In many contacts with Sir Humphry Rolleston the only time we have seen him ruffled was when it was suggested that a reference, the verification of which would have been tiresome, might be passed without checking. It was a matter for regret, and yet it was a reflection of his own modesty, that he should have written so little relatively on his own observations and thoughts and so much on the observations of others which he had carefully collected and collated. He was an omnivorous reader, and he had a regular system of filing and annotation. In using it he sought accuracy and completeness. He was ready at any time to sacrifice an epigram of his own for a quotation from somebody else, but it was important that the quotation should have appended to it the source. Medical literature was to him a kind of scripture, and he delighted in the construction of a concordance. In his Harveian Oration on cardiovascular diseases just referred to some 300 authors are quoted. In his *Medical Aspects of Old Age*, published in 1932 (a revised and enlarged edition of his Cambridge Linacre

lecture), almost 400 names of persons are given. In a little six-page essay on Thomas Sydenham which he contributed to D'Arcy Power's *British Masters of Medicine* the names of a score of eminent people are given and after the name of each one of them there follow in brackets the year of birth and of death. The research, the labour, the patience he expended over writings which in bulk were not large would have been remarkable in a man who had nothing else to do but sit in a library. When one got used to it, this quiet writing, crammed with facts, was very enjoyable, the more so for an occasional unexpected piece of irony or humour.

The first important work to appear under his own name was *Disease of the Liver, Gall-bladder, and Bile Ducts*, published in Philadelphia in 1905, and in a second revised and enlarged edition, in London, 1912, and in a third (with Dr. J. W. McNee) in 1929. Other shorter works were his *Medical Aspects of Samuel Johnson*, published in 1924; an essay *On Writing Theses for the M.B. and M.D.*, republished in 1925 after an early appearance in 1911—one of the best, as it is the shortest, of medico-literary first-aid manuals; the memoir of Sir Clifford Allbutt, published in 1929; the Osler Memorial Oration in 1930, and *The Two Heberdens* in 1933. Several pages of the British Museum catalogue are filled with the titles of inaugural and other addresses and monographs from his never-wearying pen. In 1936 he began a new enterprise in the editorship of the *British Encyclopaedia of Medical Practice*, in twelve volumes, writing several of the sections himself, including some interesting observations on the progress of medicine from pre-Hippocratic days. Amid all this output he found time to edit the *Practitioner* from 1928 onwards with Mr. Scott Stevenson, and from 1934 with Dr. Alan Moncrieff as joint editor.

In the South African War Rolleston was attached to the medical staff of the Imperial Yeomanry Hospital, Pretoria. In the war of 1914–18 he was consulting surgeon to the Royal Navy, with the rank of surgeon rear-admiral, and here his knowledge and wisdom, matched by his energy and tact, enabled him to render great service, which was recognized by the King in the conferment of the K.C.B. in 1919. Later he was a member of the Medical Consultative Board for the Navy 1924–35, also of the Medical Administrative Committee of the Royal Air Force. He served on several Royal Commissions, Departmental Committees, and the like, including the Royal Commission on National Health Insurance. Noteworthy was his service, under Lord Macmillan, on the Royal Commission on Lunacy and Mental Disorder, the sittings of which were extremely protracted. He took part in Home Office inquiries into industrial diseases from the point of view of the Workmen's Compensation Act, and was a member of the Colonial Office Committee on Medical Services, and chairman of the Ministry of Health committees on vaccination and on medical records. He was one of the two assessors at the public inquiry into the Croydon typhoid epidemic of 1937. On one of the severest mornings of that winter the tribunal began its sitting without him, and as he had a journey of several miles to make and was then in his seventy-fifth year his absence on such a day caused no surprise. But after a quarter of an hour he arrived, having been delayed by a snowbound train.

Of his work for the British Medical Association and its *Journal* much could be written. Although never a member of its Council nor a partaker in its medico-political activities, he rendered much quiet unostentatious service along his own particular line. His wise counsel, his accessibility, his willingness to give freely of his time and thought to matters which were often very detailed laid the Association under a great debt on many occasions. He joined the Association in 1895, and in that year he was honorary secretary of the Section of Pathology and Bacteriology. He was vice-president of the same Section in 1904, and of the Section of Diseases of Children in 1910. In 1899 he was vice-president of the Section of Medicine, and president of it at the Cambridge Meeting in 1920, and again at the Centenary Meeting in London in 1932. During his tenure of office as Regius Professor at Cambridge he became president of the Cambridgeshire and Huntingdonshire Branch. In 1926 he was awarded the Association's Gold Medal for his distinguished services. The engrossed testimonial handed to him on that occasion, after mentioning the objects of the award—namely, to recognize the work of those who "have conspicuously raised the character of the medical profession"—went on to state: "Every member of the Association feels that the object has never been better fulfilled than in awarding the medal to you who, during your career, have added very much to the lustre of names already illustrious." Humphry Rolleston was fittingly added to a list which included the names of Clifford Allbutt, Dawson Williams, and, of an earlier generation, William Farr.

In 1932 he was elected a Vice-President of the Association, and in 1935, when the Annual Meeting was held over-seas and had an Australian President, he served as Acting President in London. He was always ready to defend the good name of the Association. Once, after the late Lord Riddell, in a characteristically pert speech, had accused the B.M.A. of being a trade union and the G.M.C. of snobbery, Sir Humphry rose at once and very effectively defended both institutions. He did much faithful work on headquarters committees over a period of twenty years, especially the committees concerned with the arrangements for the Annual Meetings, with the Library, and with the science work of the Association, including the bestowal of scholarships and grants. One of the special committees in whose work he took a large part was that which considered the causes and treatment of arthritis, and he had a principal hand in the drafting of its report. Another noteworthy piece of service was his eighteen years' chairmanship of the Committee of Management of the Medical Insurance Agency.

His presidencies make a formidable list. He was president of the Royal Society of Medicine in 1918–20, having already been president of some of its Sections, including the Clinical Section and the Section of the History of Medicine; president of the Medical Society of London in 1927, and of the Association of Physicians in 1925 and 1929. He was also president of the former Röntgen Society and again of its reincarnation in the British Institute of Radiology. For ten years he presided over the committee of the Papworth Village Settlement. The treatment of tuberculosis and the rehabilitation of its victims was one of his interests, and he was consulting physician to the King Edward VII Sanatorium, Midhurst, and the Royal National Hospital, Ventnor. Other societies which claimed his active interest were the Eugenics Society and the Society for the Study of Inebriety. He was chairman of the Voluntary Aid Detachment Council over a period of fifteen years. Probably his presidency of the London Cornish Association was thrown in as a light relief, his interest in Cornwall deriving from Sir Humphry Davy.

In 1923 he was appoined Physician-in-Ordinary to King George V, and created a baronet in the following year. He was the senior member of the team of consultants and specialists whom Lord Dawson called in during the King's long and serious illness in 1928–9. For this he was created G.C.V.O. In 1932 until the end of the reign he was Physician-Extraordinary. The number of honorary doctorates and fellowships he held was surely a record. He was an honorary D.C.L. of Durham; LL.D. of Edinburgh, Glasgow, Bristol, Birmingham, and the National University of Ireland; M.D. of Dublin, and D.Sc. of Oxford. He was Honorary Fellow of the Royal College of Surgeons of England, of the Royal Faculty of Physicians and Surgeons of Glasgow, and of the Royal College of Physicians in Ireland, also an Honorary Freeman of the Society of Apothecaries of London. In medical circles abroad his name was held in great esteem. He was an Officer of the Legion of Honour, a corresponding member of the Academy of Medicine in Paris, and an honorary M.D. of Paris and Bordeaux. The Academy of Medicine in Rome also made him a corresponding member, and Padua and Madrid conferred on him their honorary degree. He was an honorary member of the Association of American Physicians, an honorary Fellow of the New York Academy of Medicine, and an honorary graduate of the universities of Jefferson and Pennsylvania. In 1936 he took part at Washington in a celebration much after his own heart—that of the centenary of the library of the Surgeon-General's Office, U.S. Army, and in his commemoration address he paid a worthy tribute to John Shaw Billings and his assistants and successors, all superlative bibliographers. He came home "consultant for life" to the U.S. Army medical library.

He married in 1894 Lisette Eila, daughter of Mr. F. M. Ogilvy. Their elder son, Francis Lancelot, was killed in action in the first European war, and their second son, Ian Humphry, who was in the Crown Colonies Civil Service, was killed in endeavouring to quell a riot in Zanzibar in 1936. Not much

had been seen of Sir Humphry in London during the war; he spent his last years quietly with Lady Rolleston at Haslemere in Surrey. But that indefatigable pen went on. He was a faithful friend to two Editors of this *Journal* and for many years helped them with frequent reviews and unsigned articles. Often, on the passing of a noteworthy figure in medicine, we received from him a beautifully phrased "appreciation," a perfect piece of appraisement, saying not too much nor too little.

FRANK DOUGLAS MARSH, M.B., F.R.C.S.

We regret to announce the death on Sept. 17 at Edgbaston, Birmingham, of Major Frank Douglas Marsh, *M.C.*, honorary aural surgeon and laryngologist to the Children's Hospital, Birmingham, honorary surgeon to the ear and throat department of Queen Elizabeth Hospital, and clinical lecturer on diseases of the ear and throat in the University of Birmingham.

He was born at Edgbaston on Nov. 26, 1888, elder son of the late Frank Marsh, F.R.C.S., the well-known Birmingham surgeon. From Shrewsbury School he went to Trinity College, Cambridge, and graduated B.A. with honours in the Natural Sciences Tripos of 1910. At St. Bartholomew's Hospital he won the Shuter Scholarship and qualified in 1914. He served on the Western Front as an officer in the R.A.M.C. Territorial Reserve from 1915 to 1919, reaching the rank of major and winning the Military Cross, and was for a time otologist at the Royal Victoria Hospital, Netley. On demobilization in 1919 he returned to Bart's as house-surgeon, and took the M.A., M.B., B.Ch. degrees at Cambridge and the F.R.C.S. diploma in 1920. He then set up in Birmingham as a specialist in oto-rhino-laryngology, and besides the appointments listed above he became consulting ear and throat surgeon to the Nuneaton General Hospital, the Guest Hospital, Dudley, and other neighbouring hospitals.

Frank Douglas Marsh joined the B.M.A. in 1922 and was a member of the Otological Section of the R.S.M. He published a number of papers on his subject in the *Journal of Laryngology and Otology* and elsewhere. His widow was formerly Dr. Edythe M. Bankier.

DENNIS EMBLETON, M.A., M.B.

We regret to announce that Dr. Dennis Embleton died suddenly on Sept. 17 at Ashridge E.M.S. Hospital, Berkhamsted, where he had been pathologist during the war. He was well known at B.M.A. House as a member of the Pathologists Group Committee from 1932 onwards, and as a member of the Central Medical War Committee and its predecessor the Central Emergency Committee since 1938; he was also a member of the Special Practice Committee for two periods, and of the Conference on Pathological Services which met in the year before the war. When the Association held its Annual Meeting at Plymouth in 1938 he held office as vice-president of the Section of Pathology, Bacteriology, and Immunology.

Dennis Embleton was born in Madeira in 1881 son of Dennis Cawood Embleton, M.D., and was educated at Tonbridge School, Christ's College, Cambridge, and University College Hospital, London; he qualified in 1906 and took the M.A. and M.B. degrees at Cambridge in 1911. From schooldays his heart was in the laboratory. At U.C.H. he was appointed assistant pathologist in 1907, assistant bacteriologist in 1910, and bacteriologist in 1919; he had been assistant lecturer on bacteriology in the medical school since 1912. He served during the last war with the rank of major, R.A.M.C., in charge of the laboratory of the Royal Victoria Hospital, Netley, and was also district cerebrospinal fever officer and district tetanus inspector. Embleton published a number of articles in medical and scientific journals, both in this country and on the Continent, on the dietetic treatment of diabetes, the pathogenicity and virulence of bacteria, the Wassermann reaction, the tuberculin reaction, bacterial endotoxins and exotoxins, meningococcus infections, and bacterial carriers. One of his early writings was a joint paper with his senior colleague, Dr. F. H. Teale, on anaphylaxis and its bacterial aspects read at the Annual Meeting of the B.M.A. at Brighton in 1913. Twenty-five years later he presented to the same Section an analysis of the glucose-tolerance curves from a large number of obese patients. He had been an active member of the Association of Clinical Pathologists from the time of its formation.

A friend of undergraduate days writes: We have lost a medical scientist who worked always in strict obedience to his sense of duty. Dennis Embleton was steadfast of purpose and honest to the core. Great height and almost boyish good looks made him a conspicuous figure anywhere; and it needed little discernment to perceive the thoroughness and sincerity of the man or the natural reserve behind his straightforward speech and manner. In congenial company he would unbend, with a most delightful smile and sense of fun.

HELEN LUKIS, M.D., B.S.

We regret to announce the death on Sept. 9, after a long illness, of Dr. Helen Lukis, honorary medical officer to the Kingston Victoria Hospital, Surrey. For a number of years she had been a keen worker for the British Medical Association, both at headquarters and as secretary and, later, chairman of the Kingston-on-Thames Division.

Dulcie Helen Lukis was the youngest daughter of Sir Pardey Lukis, K.C.S.I., who was Director-General of the I.M.S. from 1910 until his death in 1918, and held many other high offices in India. One of her brothers, T. S. Lukis, after a brilliant career at his father's hospital (Bart's), was killed in action in 1915. Helen studied medicine at St. Mary's Hospital and graduated M.B., B.S.Lond. in 1923. She obtained the M.D. degree in 1926 after serving as house-physician and house-surgeon at St. Mary's. Settling in practice at New Malden she worked also as honorary anaesthetist to the South London Hospital for Women and Children and, for a time, as clinical assistant in the ear, nose, and throat department of the Queen's Hospital, Hackney. Her excellent essay, which won the Sir Charles Hastings Prize of the B.M.A. in 1934, was published in the following year as a book under the title *Problems of Anaesthesia in General Practice*. This dealt with every side of anaesthesia from the point of view of the practitioner, and it filled a gap in medical literature; the aim throughout was to show the reader how to do the best for his patient, coupled with a recognition that what is best in the hands of one type of administrator is not necessarily the best in the hands of another type. Her active service in the B.M.A. began thirteen years ago when she undertook the duties of honorary secretary of the Kingston Division, and on relinquishing that office in 1937 she was elected chairman. She represented her Division at eight consecutive Annual Meetings (1929–36); she served on the Journal Committee for two periods; and she had been a diligent member of the Organization Committee, the Propaganda Subcommittee, and the Maternity and Child Welfare Subcommittee.

All who knew Helen Lukis's energetic nature and gaiety of spirit will feel sorrow at the passing of a very able colleague at an age when many years of good work should have lain ahead of her.

A colleague writes:

Helen Lukis's choice of general practice in preference to specialization was an index of her outlook on the profession. To her the patient was a human personality and not merely a "case," and when the human as well as the clinical aspect of medicine appeals, the continuity of general practice gives something which lies outside the experience of a consultant. And because she had her heart in the human side of her profession and brought a personal interest, a steady cheerfulness, and a calm competence to aid her undoubted ability, her eighteen years of service in Malden built up for her a practice of considerable size among men, women, and children, drawn from all circles of society over a wide radius—a practice to which she was "our Doctor Helen." Apart from her main work as a general practitioner she had considerable local reputation as an anaesthetist and an expert on eyes. She served on the honorary staff of the Kingston Victoria Hospital for a number of years as surgeon. It was characteristic of her that, the busier her professional life became, the more she filled her fragments of leisure. An adept organizer, she applied that gift in double measure to her own life and managed to pack into a few spare hours activities which would have fully occupied a woman with no other ties. Social life meant, for her, active use of body and mind. She took a lively part in those local activities which marched with her profession. As divisional surgeon she did much for the prosperity and efficiency of the local branch of the St. John Ambulance Brigade. But, above all, she loved young people and was the beloved aunt, not only of her many real nephews and nieces, but also of numerous children

whom she had brought into the world. Her life had included many victories over a frail body, and in the early part of the war the overload of practice life, plus the labour of love in building up first-aid organization in Malden, led to a serious cardiac breakdown. Having overcome this, she returned to her work to meet the strain of the London blitz, the reduction in number of practitioners on civil duty, and the peak-load of Boards for the Women's Services. In the early part of 1944 the onset of her last illness came, and, after a gallant and ever-cheerful period of suffering, she entered into her rest.

News has reached this country from New Zealand of the death of a very old member of the British Medical Association, Dr. JAMES WHITTON, who was elected as long ago as January, 1892. He died suddenly on July 3, 1943, from an attack of angina pectoris at the age of 83. Dr. Whitton studied medicine in Dublin and graduated M.D. of the old Royal University of Ireland in 1880. He obtained the M.A.O. degree in 1886 and the F.R.C.S.Ed. diploma in 1899, having taken the licence of the Edinburgh College in 1883. After practising in Wellington, N.Z., for many years, he retired from active work and lived in the suburb of Lower Hutt. His wife survives him.

L. V. C. writes: Having known Dr. ALEXANDER FRANCIS professionally for over forty years and enjoyed intimate knowledge of him and his work I feel that, in justice to his memory, I cannot do less than place on record his unselfish devotion to the relief of suffering asthmatics. Combined with his special treatment, attested to in the admirable obituary notice published on Sept. 2, no possible factor was omitted from his survey of each case, and his patients were always loud in their praise of his thoroughness, and many almost worshipped him for the difference he had made to the comfort of their lives. He will be greatly missed.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* notifications of dysentery, scarlet fever, measles, and diphtheria were higher than last week by 203, 114, 69, and 36 respectively. Those for whooping-cough fell by 166.

The only local increase of any size in the notifications of scarlet fever occurred in Lancashire, where 63 more cases were recorded than last week. In Durham there was a rise of 59 in the notifications of measles. The incidence of whooping-cough tended to fall in most areas, but the only decreases of note were in Lancashire and Gloucestershire, which had respectively 42 and 41 fewer cases than last week. Deaths of infants from diarrhoea and enteritis in the large towns rose from 63 to 102.

The record total for dysentery notified last week was exceeded by 203. The majority of the 622 cases occurred in the north. The chief centres of infection were Hertfordshire 80, London 76, Surrey 67, Southampton 45, Essex 38.

In *Scotland* there was again a small rise in the common infectious diseases of childhood; the increases over last week were: diphtheria 11, measles 19, scarlet fever 20, whooping-cough 69. The notifications of dysentery rose by 18, 55 of the total of 111 cases being in Glasgow. Deaths of infants from diarrhoea and enteritis fell from 57 to 31 in the large towns, all but 4 of these occurring in Glasgow.

In *Eire* the high incidence of diarrhoea and enteritis among infants was maintained; 136 of the 172 cases were reported in Dublin C.B.

In *Northern Ireland* the notifications of diphtheria rose by 11. The largest return for this disease was Antrim R.D. 6.

Week Ending September 16

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,591, whooping-cough 1,083, diphtheria 541, measles 1,155, acute pneumonia 291, cerebrospinal fever 37, dysentery 351, paratyphoid 8, typhoid 5. Fourteen cases of poliomyelitis were reported during the week, and 2 of polio-encephalitis.

Correction

It is regretted that several small errors occurred in the printing of the table of infectious diseases for the week ending Sept. 2 (*Journal*, Sept. 23). Notifications of measles for England and Wales were 1,069, instead of 1,669 as printed. Thirteen cases of paratyphoid fever were notified in England and Wales, 1 in London, and 3 (paratyphoid B) in Scotland. There were 10 cases of typhoid fever notified in England and Wales, 2 in London, 4 in Scotland, 14 in Eire, and 1 in Northern Ireland. No deaths were reported for either of these diseases.

No. 36

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Sept. 9.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1944 (a)	(b)	(c)	(d)	(e)	1943 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	41	—	18	1	1	33	3	19	—	—
Deaths		—	—				—	1		
Diphtheria	481	14	158	79	26	700	36	180	72	16
Deaths	3	1	2	1	—	6	1	1	2	1
Dysentery	622	76	111	—	—	201	8	112	—	—
Deaths				—	—				—	—
Encephalitis lethargica, acute	—	—	1	—	—	—	—	1	1	—
Deaths		—					1			
Erysipelas			30	10	2		—	37	11	1
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years				72					153	
Deaths	102	6	31	22	12	52	6	14	28	8
Measles*	1,138	14	84	13	27	516	41	87	6	4
Deaths	—	—	—	—	—	2	—	—	—	—
Ophthalmia neonatorum	63	3	15	2	—	95	2	20	1	—
Deaths										
Paratyphoid fever	3	—	—	—	—	5	—	1	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenzal†	303	10	7	—	2	308	23	7	—	4
Deaths (from influenza)	4	—	1	1	—	6	—	1	—	1
Pneumonia, primary			155	11				150	7	
Deaths		11		8	5		16		4	4
Polio-encephalitis, acute	3	—				3	—			
Deaths		—					—			
Poliomyelitis, acute	24	—	12	3	—	9	1	—	3	—
Deaths		—					—			
Puerperal fever		1	11		—	—	4	16	—	—
Deaths										
Puerperal pyrexia‡	117	11	11	—	1	157	14	9	1	1
Deaths		1					1			
Relapsing fever	1	—			—	—	—			—
Deaths										
Scarlet fever	1,251	30	224	27	44	2,432	235	303	36	75
Deaths	1	—	—	—	—	—	—	—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Typhoid fever	7	1	2	10	1	9	1	6	3	4
Deaths	—	—	—	—	—	—	—	—	—	1
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough*	1,223	47	130	33	7	1,751	123	255	43	19
Deaths	6	2	2	1	1	12	—	3	1	—
Deaths (0–1 year)	338	29	77	60	30	305	31	70	52	21
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	3,621	399	577	224	114	3,628	488	564	177	125
Annual death rate (per 1,000 persons living)			13·3	14·5	§			12·7	11·6	§
Live births	5,843	361	811	389	263	5,811	729	817	318	261
Annual rate per 1,000 persons living			16·5	25·2	§			16·7	20·9	§
Stillbirths	185	9	21			211	27	28		
Rate per 1,000 total births (including stillborn)			25					33		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

‡ Includes puerperal fever for England and Wales and Eire.

§ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

Medical News

The opening address to students of the Welsh National School of Medicine, Cardiff, will be given by Prof. W. E. Le Gros Clark, F.R.S., of the University of Oxford, on Tuesday, Oct. 3, in the Medical School.

At the opening of the 103rd session of the College of the Pharmaceutical Society of Great Britain at 17, Bloomsbury Square, London, W.C., on Wednesday, Oct. 4, at 3 o'clock, the inaugural address will be given by the president, Mr. Frederick George Wells.

The Food Education Society, 29, Gordon Square, W.C.1, announces that Miss Rose Simmonds, dietitian at Hammersmith Hospital, will give a lecture on "Food and the Sick," on Monday, Oct. 23, at 2.30 p.m., at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street.

"Red Army Medical Service," will be the chief film at a special showing arranged by the Leeds Division of the B.M.A. at the Majestic Cinema, Leeds, on Sunday, Oct. 1, at 3 p.m. The programme will also include a film from the series on "Technique of Anaesthesia," dealing with nitrous-oxide–oxygen–ether anaesthesia. All medical members of the Services in the Leeds area will be welcomed.

The British Insulin Manufacturers announce that the prices of insulin, protamine-zinc-insulin, and globin insulin are to be reduced on Monday, Oct. 2, when a new schedule of retail prices will come into operation.

On Tuesday, Oct. 3, all voluntary hospitals serving the City and Metropolitan Police Districts will unite in their combined street collection. Gifts may be sent to the chairman of the Central Committee, Lord Luke, 36, Kingsway, London, W.C.2.

The Ophthalmological Society of Egypt (Dar El Hekma, 42, Kasr El Ainy Street, Cairo), in order to encourage scientific ophthalmic work, will award a prize to the value of £E.20 for the most valuable contribution brought before the annual congress of the Society by any of its members of less than 20 years' practice, according to regulations, of which a copy may be had from the honorary secretary.

Dr. Alan Churton Taylor, medical officer in charge of first-aid post, Civil Defence Casualty Service, Southsea, has been appointed M.B.E., and Frederick George Mitchell, of the rescue service, Portsmouth, has been awarded the B.E.M. The citation in the *London Gazette* reads:

> During an air raid a H.E. bomb destroyed premises, and a man was trapped in a cellar which had collapsed and was covered with wreckage from the building above. After debris had been cleared away, Dr. Taylor and Mitchell entered the cellar through a small opening between two concrete slabs, one of which was supporting the debris of the house. The casualty was trapped at the base of these slabs, and the cutting of the reinforcement had to be effected by means of a hacksaw. Each time a piece of reinforcement was cut through the supporting concrete slabs moved, thereby endangering the lives of the rescuers. Neither Dr. Taylor nor Mitchell came out of the hole until the casualty was eventually removed 2 hours later. Dr. Taylor and Mitchell showed courage and determination with a total disregard of personal danger.

A revised and enlarged British standard specification for conversion factors and tables (B.S. No. 350: 1944) has been issued by the British Standards Institution. This comprises linear, square, and cubic measures, measures of capacity, weights, speeds, stresses and pressures, weight per unit length, densities, concentrations, forces, moments, moments of inertia, work, heat, energy, and power. There are also temperature conversion charts and tables, and wire and sheet metal gauge sizes expressed in decimals of an inch and in millimetres. Copies of the specification can be had from the Publications Department, British Standards Institution, 28, Victoria Street, London, S.W.1, price 3s. 6d. post free.

The Czechoslovak Government, in consultation with UNRRA, has organized a medical mission which will shortly be leaving London to assist the health services of liberated Czechoslovak territory and to bring them sufficient hospital supplies to tide over the emergency period. The thirty doctors of this mission, led by Dr. Ungar, many of them specialists in health administration, will be assisted by a staff of trained nurses and social workers. Their instructions are to follow as closely as possible upon the retreating enemy forces, surveying medical and nutritional needs and aiding in epidemiological control. The rapid organization of this mission has been made possible by the British Government and local authorities having granted immediate leave to Czechoslovak medical personnel.

Medical officers of health are asked to arrange for the medical examination, particularly with regard to tuberculosis, of nurses employed in residential and wartime nurseries in their areas. Any nurse found to be suffering from active tuberculosis in an infective state should be excluded from nursery work.

Letters, Notes, and Answers

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 2111. TELEGRAMS: *Articulate Westcent, London.*

MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 2111. TELEGRAMS: *Medisecra Westcent, London.*

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

ANY QUESTIONS?

Byssinosis Regulations

Q.—*What are the Byssinosis Regulations? In my district no one seems to know them.*

A.—Schemes for compensation and benefit for byssinosis have been made by the Secretary of State under the Workmen's Compensation and Benefit (Byssinosis) Act, 1940, and came into force on May 1, 1941. Administrative and Medical Boards appointed by the Secretary of State administer them. The compensation scheme applies to all *male* workmen employed at any time on or after that date for a period or periods amounting to not less than 20 years in cotton-rooms, blowing-rooms, or card-rooms, in factories in which the spinning of raw cotton is carried on. The weekly payments made are the same as those made in respect of total incapacity under the Workmen's Compensation Act. The benefit scheme applies to all *male* workmen employed under the same conditions as above, *before but not on or at any time after* May 1, 1941. The benefit payable is 15s. per week. For both schemes the workman must be totally and permanently incapacitated for work, or, for the purposes of compensation only, have died as a result of the disease. Fuller details of both schemes are given in Statutory Rules and Orders, 1941, Nos. 525 and 625, and 1944, No. 504, published by H.M.S.O., and other particulars may be obtained from Mr. John Lowe, the Secretary of the Administrative Board, 68, Deansgate Arcade, Manchester, 3.

Surgical Treatment of Migraine

Q.—*A patient with very severe migraine for the last few years has tried various types of treatment without the slightest result. Is the operation of cutting the cervical branch of the sympathetic nerve any use?*

A.—An account of the surgical treatment of migraine by section of the cervical sympathetic was given in an article in this *Journal* written by G. F. Rowbotham (1943, **1**, 12). Very few cases have been done, but enthusiastic results have been reported. There is a certain amount of anatomical evidence to support an operation of this sort, but at present it is best to treat with reserve the results which have so far been published. The disability resulting from section of the sympathetic high up in the neck is not great, and this alone might justify the procedure as a last resource when all other methods have failed.

Tentorial Pressure Cone

Q.—*Would you state briefly the causes of "traumatic tentorial pressure cone," and the chief diagnostic symptoms and signs?*

A.—The prime cause of traumatic tentorial pressure cone is increase in pressure above the tentorium. After trauma this is likely to be a haematoma, either subdural, extradural, or intracerebral, or cerebral oedema or infection. It is unwise to look upon the condition as different from a pressure cone due to any other cause of high intracranial pressure. The main symptoms and signs are those of the cause. There will be signs of a head injury with high pressure and the patient will probably be in coma. Added to this there will be signs of the complication, such as intra- or extra-cerebral bleeding, and, finally, there will be the signs of the cone itself. These will usually be variations in consciousness, with altering pupillary signs, increasing external ophthalmoplegia, and also alterations in the pulse rate—in short, signs of brain-stem compression. Lumbar puncture may show a very low pressure or the physician may be unable to obtain any cerebrospinal fluid at all; but this must not be expected, for the interruption of the flow of cerebrospinal fluid is likely to vary from hour to hour. In no event should cerebrospinal fluid be removed. The object should be to reduce pressure above the tentorium.

Death from Drowning and under Anaesthesia

Q.—*In the resuscitation of the apparently drowned by artificial respiration, recoveries have been recorded after as long as 6 to 8 hours. In anaesthetic accidents, when the heart has ceased to beat, the life of brain cells is generally accepted to be a matter of seconds only. What is the explanation of this apparent discrepancy? Is there any record of cardiac massage being tried in the former? What in your opinion would be the usefulness of this procedure?*

A.—The apparently drowned patient starts off with the advantage that, when resuscitative measures are applied, his body tissues do not have to excrete an overdose of anaesthetic agent before normal respiration can be resumed. In anaesthetic misadventures it is rare for recovery to be recorded, no matter what measures are resorted to, after the heart has ceased beating for five minutes. If an animal were held with its head under water until the heart ceased beating for a similar length of time, it is improbable that any restorative measures would be effective. Long-delayed recovery of the apparently drowned after prolonged artificial respiration is explained on the grounds that over-ventilation from artificial respiration, enthusiastically administered, prevents the resumption of normal respiration. A victim is pulled out of the water. If he is dead he is dead, and no restorative measures will be effective. If there is still a spark of life, artificial respiration by ensuring an intake of oxygen should effect recovery. Artificial respiration, however, is often applied with unnecessary vigour and maintained by a series of willing helpers. This hyperventilation lowers the CO_2 in the alveolar air below normal, and this, in turn, results in a lowering of the tension of the blood CO_2 below the level necessary to initiate normal respiration. At a class demonstration it can be shown that active hyperventilation on the part of the volunteer "tends towards unconsciousness" (Haldane and Priestley, 1934, p. 189). Gross hyperventilation from artificial respiration mitigates against recovery of consciousness in the unconscious patient. Less enthusiasm in the matter of artificial respiration allows CO_2 to build up and start normal respiration.

The Vertical Fluoroscope

Q.—*What are the present views on (a) the use of the vertical fluoroscope and its scope for use in the consulting room? (b) Is it of great use in the diagnosis of chest conditions? (c) What type of fluoroscope would you recommend for use in the consulting room? (d) Is there any risk in using the fluoroscope, and what protection is necessary?*

A.—Screening and radiography are complementary to each other and only rarely can either be omitted without risk of error. Radiology plays a vital part in the diagnosis and control of the treatment of intrathoracic disease, as it is indispensable to establish normality. Training and experience in radiological interpretation and clinical correlation is imperative; without this the use of apparatus will be a menace and may degrade what otherwise might have been sound clinical judgment. The practitioner would be well advised to consider that, should trouble arise, his work may be assessed on the presumption that he has specialist training and experience.

For ambulatory patients (consulting-room practice) the vertical apparatus is preferable, but units combining facilities for examinations erect and horizontal are available. The erect examination alone, however, would cover the greater part of consulting-room practice. The apparatus should provide for radiography at not less than 4 ft. 6 in. distance and with an exposure time of not more than 1/10 second for the biggest patient. Screening alone is not an adequate examination.

With regard to protection, reference should be made to the recommendations of the British *X*-ray and Radium Protection Committee, available free on application to the General Secretary, British Institute of Radiology, 32, Welbeck Street, London, W.1; also to the article, "Effects of Radiation on Workers" (*Brit. J. Radiol.*, Jan., 1943, p. 3), and to the reply in the *Journal* of April 1, 1944 (p. 480), and also Sept. 23, 1944 (p. 423).

Therapeutic Dosage of Iron

Q.—*What is the present explanation of the fact that the treatment of mycrocytic anaemia requires 100 times as much iron per day as is the daily requirement of iron in food? (90 gr. of ferri et ammon. cit. contain about 1,000 mg. of iron, and the daily requirement in food is 10 mg.) The hypothesis of Prof. Bunge 50 years ago was that medicinal iron protected the food iron from being changed into non-absorbable sulphide.*

A.—The dose of a vitamin or similar food principle required to cure an established deficiency is usually of the order of ten times the maintenance dose. Accepting the figure of 10 mg. as the daily requirement of iron in the food, we obtain a therapeutic dose of 100 mg. Fe, or 500 mg. (gr. 7½) of iron and ammonium citrate a day. In practice it is found that something like two out of three women with hypochromic anaemia will recover with a dose as small as this. It is because of the third who will not that it is the rule to give much larger doses of iron. The therapeutic dose of iron by injection is only 30 mg. Fe (gr. 2½ iron and ammonium citrate), which unfortunately approximates closely to the toxic dose by this route. When women who are resistant to treatment with iron by mouth are investigated, it is usually found that their serum iron does not rise as it should after a dose of iron, and presumably therefore the iron is not being absorbed.

The factors concerned in the absorption of iron are complex, but it is doubtful whether sulphide is of any importance. Medicinal iron is absorbed as such and used directly for the manufacture of haemoglobin; this has been demonstrated by giving preparations of iron which have been made artificially radio-active by the cyclotron and can therefore be traced through the organism. The hydrochloric acid of the gastric juice is generally believed to promote the absorption of iron, whereas phytic acid (from whole-grain cereals) and phosphoric acid interfere. Reducing substances, such as are present in proteins, favour absorption of iron, and massive doses of vitamin C—i.e., 50 to 100 mg. t.d.s.—at the same time as the iron often have a striking effect. Absorption of iron is apparently favoured by a high concentration of bivalent ferrous iron in the lumen of the intestine and a low concentration of iron in the wall of the gut. The traffic is one way only—from intestinal lumen to epithelial cell, and from epithelial cell to plasma. We do not know the form in which the iron is transported, but for a time at least it may enter into complex combinations comparable with haemoglobin and cytochrome.

Coronary Thrombosis and Car Driving

Q.—*Is it safe for a man who has had one attack of coronary thrombosis to drive a motor car? I had an attack a few years ago, and have acted on the assumption that it is unsafe. What precipitates an attack? Mine occurred in bed. My elder brother had one when walking up a long flight of stairs.*

A.—There is no reason why a man who has had an attack of coronary thrombosis and has made a good recovery should not drive a motor car. It might even be said that motoring would enable him to get about with the least exertion. It would be a different matter if there were cerebrovascular symptoms, but these are not expected.

Few conditions are known to precipitate an attack of coronary thrombosis. Occasionally loss of blood or an operation or a venous thrombosis may do so, but in the great majority no immediate or extraneous cause for it will be found. The basic cause is an exacerbation of the atheromatous process, with thrombosis in the wall or lumen of the affected coronary artery.

Treatment of Ganglion

Q.—*Is there any other treatment, apart from the "Family Bible" and open radical removal, for ganglion? Do they often disappear spontaneously?*

A.—Apart from surgical removal (itself not always radical on account of technical difficulties) there are other methods of treating ganglia which are occasionally used, although no sort of guarantee can be given that they will be successful. If the contents are reasonably fluid they may be aspirated through a large-bore needle, aided by local pressure on the swelling, and a few minims of a sclerosing solution, preferably one containing carbolic, injected. This may require repetition. Another method is an adaptation of the seton. Stout threads, usually four, are inserted through the base of the ganglion by transfixion, the contents being expelled through the needle punctures by pressure. The threads are so tied together that the needle punctures are kept stretched open; they remain *in situ* for about ten days. Ganglia have been known to disappear spontaneously after violent use of the part (probably by rupture), but this is an infrequent event.

Treatment of Otitis Externa

Q.—*A male patient aged 65, of stout build with gouty tendency, has complained for the past few years of intense irritation of the external auditory meati, with a sense of heat and fullness causing, more recently, slight deafness. He now has a chronic eczematous condition of the external auditory meati. I have tried all the usual remedies, but the condition recurs.*

A.—Dermatologists and otologists have twice combined to discuss otitis externa, which indicates its intractable nature. The degree of itching varies and requires treatment of the gouty tendency. Frequently the local eruption is maintained by remedies which are too strong and is at once relieved when simple applications are substituted, such as cleaning the meatus carefully with liquid paraffin and applying oily calamine. Small doses of *x* rays may help. If debris accumulates the ear must be syringed out. Penicillin might help by attacking the infective fraction, but is not available for this purpose; on the other hand, sulphonamides almost invariably cause aggravation. (See also answer given in the *Journal* of May 20, 1944, p. 707.)

Otosclerosis and Internal Secretion

Q.—*What is the supposed connexion between otosclerosis and internal secretion? What kind of hormonal treatment of that disease is recommended?*

A.—Some authorities have advanced the theory that otosclerosis may be caused by a lack of sex hormones, and have recorded apparent improvement in female otosclerotics following the administration of oestrogens. Most observers fail to confirm this. The cause of otosclerosis is still unknown, and so-called "cures" are usually due to suggestion. It is possible, however, that hormones, by their "tonic" effect, enable the patient to make a greater effort to hear. It is well known that the hearing power of such patients varies directly with the state of their general health.

Blue Bag for Stings

Q.—*With reference to the recent question on bee stings and wasp stings (JOURNAL, Aug. 26, p. 295), there is, so far as I know, nothing that is so good as the old-fashioned washing blue, or blue bag. I should be most interested to know the composition of this. Perhaps it is efficacious on account of its alkalinity.*

A.—There are a number of formulae for the preparations known as washing or laundry blue and blue bag. The essential constituent is ultramarine, which is compressed into a fairly hard mass with the use of binding agents to prevent its too rapid disintegration and solution. These binding agents are usually of an alkaline nature, such as bicarbonate of soda, and glucose is also commonly present.

The rationale for the use of blue bag for the treatment of wasp stings is not clear. Its use for bee stings is understandable, as these are acidic in nature. Wasp stings, on the other hand, are alkaline in nature, and it would appear that the use of a weak acid such as acetic acid or vinegar would be more effective. Nevertheless, blue bag is frequently used in the treatment of wasp stings and appears to give relief.

Habitual Hypnotic

Q.—*I have recently seen two doctors who told me they take nembutal 3 gr. (two capsules) every night, which ensures them a good night's sleep and they wake up refreshed, as a result, in the morning. Otherwise they sleep badly. There is no question of taking more than 3 gr. nocte. Is any danger, other than habit, likely to accrue from this practice?*

A.—Nembutal is one of the more quickly destroyed barbiturates and, therefore, relatively safe. The dose indicated would not be expected to produce cumulative effects. Idiosyncrasy to nembutal is exceedingly rare and would have shown itself already had it been present. The danger would seem to lie in the fact that such a habit postpones inquiry into the cause of the insomnia. The symptom is treated but the cause of it remains undiagnosed.

Diet for Steatorrhoea

Q.—*A patient with steatorrhoea finds a fat-free diet monotonous. Are pancreatic extracts of any use?*

A.—The fault in steatorrhoea is thought to lie in the intestinal cell, and as yet there is no specific therapy which can remove this fault. The causes of steatorrhoea are varied. Thus, it may occur in obstructive jaundice, gastro-colic fistula, extensive resection of the ileum for various causes, acute and chronic pancreatitis, some types of enteritis, after total gastrectomy, and, finally and most commonly, in the group comprising coeliac disease, adult idiopathic steatorrhoea, and tropical sprue. Recent work has shown that among the last group, at any rate, some have been due to pancreatic disease, but the diagnosis can be made only either by demonstrating an absence of pancreatic ferments by duodenal intubation or by necropsy. The amount of fat usually absorbed is about 95% of that ingested, whereas in steatorrhoea this figure falls usually to between 65 and 85%, except in severe exacerbations with diarrhoea. Under controlled conditions it has been shown that a high-protein diet leads to a higher percentage of fat absorption, and clinical experience has shown that the most consistently useful treatment is a high-protein diet with a restricted fat intake. Some relaxation may be made in many cases, especially in regard to butter, but the daily quantity of fat should not exceed 50 g. The need for increased protein in these cases has been recognized by the Ministry of Food, and extra meat rations can now be obtained in place of the normal fat ration.

Generally speaking, the use of pancreatic extracts and of pancreatic and duodenal secretions has been disappointing. The dried extracts show great variation in their potency and contents. In cases of proved pancreatic disease Rhoads and his co-workers have demonstrated some improvement in fat absorption by their use, and pancreatin *B.P.* gr. 15 twice daily two hours after food may be given a trial, but its use does not permit any marked relaxation in dietary restrictions. Many references will be found in a recent article by Stannus (*Trans. roy. Soc. trop. Med. Hyg.*, 1942, **36**, 12[illegible]. A suitable 50-gramme fat diet is appended:

Daily Allowance.—1 to 1½ pints household skimmed milk. 3 to [illegible] oz. lean meat, liver, fish, rabbit, chicken, or lean ham. Restrict fats to 1/2 oz. of butter or margarine. Note: *Obvious meat fat should not be taken.*

Breakfast.—Porridge, fruit, or cereal as desired. Tea with mil[illegible] from allowance. Butter from allowance. Bread or toast without restriction. Jam, honey, syrup, or marmalade without restriction.

11 a.m.—Tea with milk from allowance, or meat extract o[illegible] marmite. Toast or biscuits.

Dinner.—Meat from daily allowance. Potatoes and all other vegetables as desired. Vegetables must be well cooked, and boiled *not fried.* Fresh, dried, or tinned fruit of all kinds. (Cooked fruit may be sieved if desired.) Milk pudding—e.g., sago, rice, tapioca, semolina, or custard—from daily allowance.

Tea.—Tea with milk from allowance. Bread as desired. Butter from allowance. Jam, honey, jelly, marmalade, or syrup as desired. Salad, tomatoes, etc., when available.

Supper.—Meat from daily allowance. Vegetables of all kinds without restriction (not fried). Bread without restriction. Butter from daily allowance. Fruit as desired.

The following must be avoided: Overdone and well-cooked meat. Food fried or cooked in fat. Dried and fat fish, such as salmon, herrings, trout, or mackerel. Grease, fat, salad dressing, suet puddings, cakes, and pastry. Toffee and chocolate.

LETTERS, NOTES, ETC.

The Solvent of Colourless Flavine

Dr. J. B. KEARNEY (Kingston Hospital) writes: I would like to ask Mr. Victor Bonney and Mr. Sandeman Allen one question in connexion with their recent article on colourless flavine, in which they suggested that a solution of this substance might replace "Bonney's blue" as an efficient skin antiseptic (Aug. 12, p. 210). Is their rectified spirit really necessary? Our pharmacist informs me that it is much more expensive than ordinary industrial spirit. In Kingston Hospital "Bonney's blue" made up with industrial spirit suitably diluted has been used for many years as an external antiseptic with much success. However, it was chiefly in the treatment of vaginal discharges and septic skin conditions that it was used by us, and now, as we are contemplating utilizing this colourless flavine solution as a pre-operative skin antiseptic, we would like to know the views of the authors on the importance of rectified spirit in the make-up of their new preparation. Would not a suitable dilution of industrial spirit be equally or, at any rate, sufficiently effective as a solvent? If so, it would mean a substantial reduction in the cost of dispensing this antiseptic, and therefore would offer a greater likelihood of its becoming more universally popular.

Release of Wounded Medical Officer

M.B., CH.B. writes: I was interested in Dr. F. C. Durbin's observations on the Army Council's attitude to wounded medical officers (Aug. 12, p. 232). His remarks apply, not quite so forcibly to those of us who have been invalided to Britain, after varying periods of service in oversea theatres of war, on account of chronic "medical" conditions. I am one of these unfortunates, now only fit for home service, and not likely to be fit for oversea service again. I have not applied for release, and I don't think many of us would do so, but there has never been any suggestion that I might be released, and my place taken by one of the many young men in E.M.S. hospitals and general practice who have not yet experienced the discomforts of Army life and separation from family and home, sometimes for many years. It would appear that the only way a medical officer can obtain release from the Services is either to be killed outright or be hopelessly mutilated, or to contract some disease which is considered to be incurable. There is no happy medium.

Interpretation of G.C.F.T.

Messrs. BURROUGHS WELLCOME write: In the reply which appeared under "Any Questions?" in the *Journal* of Sept. 2 (p. 3[illegible]) it was stated that there was difficulty in obtaining a suitable antigen. We introduced "Wellcome" brand gonococcus antigen in M[illegible] 1942, since which time it has been used by a large number of workers and has been found completely satisfactory.

Disclaimer

Mr. E. HAMBLY (Seer Green, Bucks) writes: I wish to dissociate myself entirely from the articles in the lay press which were written without my consent, and which were copied from my article in the *British Medical Journal* of Sept. 9 upon the subject of severe fracture-dislocation of the spine with recovery. May I also take the opportunity of apologizing for my omission in thanking Dr. K. Mann in this article for his great assistance on the medical side of the case described.